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# Anneal Each Heat Independently

## Close Control Features New Practice in Malleable Plant—Ovens Charged Through the Top—Handling Devices Save Labor Costs

BY BURNHAM FINNEY*

ANNEALING malleable castings in mixed heats—a long-established practice—has been abandoned by the Southern Malleable Iron Co., East St. Louis, Ill., which has installed a system of single-heat annealing. By strict adherence to definite heat-treating schedules the company has never had an anneal run under 98.5 per cent, nor has it produced over-annealed castings.

Since malleable castings should show some combined carbon as evidence that they have not been over-annealed, the percentage of anneal is determined by the amount of combined carbon in the malleable test bar. By close control of the temperature during the annealing process, the normal maximum of 2.7 per cent of combined carbon has been reduced to an average trace of as little as 0.03 per cent.

The annealing cycle for the castings from each heat is scheduled after an analysis of the iron has been made. Consequently, the heat treatment is made to vary according to the requirements necessary to produce a perfect anneal. Obviously, castings from two

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*Annealing Pots Are Lowered into the Ovens by Crane, the Tops of the Ovens Being Removable*

heats that differ from each other as much as 0.05 per cent cannot be placed in the same annealing oven.

Annealing practice at this plant calls for a maximum temperature of 1720 deg. Fahr., which is reached at a uniform rate of increase in 36 hr. This temperature is held for a specified time, then is gradually reduced to a determined temperature known as intermediate and later is decreased to a temperature known as equilibrium. These decreases are never more than 10 deg. an hour and often are only 6 deg. The period covered by this process ranges from 48 to 100 hr.

By means of its mix and its single-heat annealing practice the company has found, from numerous tests, that, with three times the amount of sulphur ordinarily considered as a deterrent, the tensile strength of the castings is as good as that of iron in which the sulphur content is low, and in some cases better. In putting into effect the new method, which specifies that only the castings from a single heat be placed in an annealing oven, the company has constructed ovens which differ materially in design from those used in most malleable foundries.

### Ovens Are Charged From Above

Annealing ovens are built in batteries of 12, each oven being 5 ft. wide, 6 ft. deep and 7 ft. high. Since they rest on a foundation 2 ft. below the floor level, their height above the floor is only 5 ft. The interior walls of each oven are lined with fire brick, and they are covered by an insulating material on the outside. The exterior consists of a steel jacket. The top, made of insulating material, is removable, having holes in the four corners to accommodate hooks. This design makes it possible to attach a chain of four hooks from an overhead crane, and lift the top off the oven, whenever annealing pots are to be put in or taken out. Thus the top, instead of the customary door at the front of the oven, serves this purpose.

Each oven holds eight annealing pots, the capacity of each of which is 1200 to 1500 lb. The design of the ovens is such that the pots can be arranged in two vertical rows, the pots being handled by crane. All ovens are gas-fired and are controlled by pyrometers. It is the duty of one man constantly to watch the temperature of the ovens and to take readings every 30 min. The pyrometric equipment is housed in a small wooden structure at the end of the row of ovens. A portable check pyrometer, which is calibrated once a week, is used to test the pyrometers.

Eighteen test bars are made from each heat, so that customers can obtain test bars on every heat, if called for within six months of its date. Adoption of this plan has eliminated the possibility of dispute regarding the analysis of the iron. Furthermore, every casting of a size has two test lugs. One is broken off in the foundry immediately after the annealing cycle is completed, while the other forms a sample for the use of customers.

Iron is melted in a 20-ton oil-fired air furnace, which has a waste-heat boiler attached. At the head of the boiler is a suction fan. When the damper of the furnace is opened and the fan is turned on, the hot gases going to the furnace stack are drawn up through the boiler. This boiler furnishes steam for the operation of a steam air compressor, which supplies 500 cu. ft. of air a minute. The air from the compressor carries a pressure of 100 lb. and is used for molding, sand blasting and sand riddling.

On either side of the furnace stack there are large openings, just above the channel, where hot gases pass to the boiler. The cold air that is introduced, mixing with the hot gases in the stack, modifies the tempera-

*A Special Carrier Suspended from an Overhead Crane Has Three Hooks and Six Rings. One hook is attached to the wheel of a wheelbarrow and two rings are slipped over the two handles. In this manner the carrier is capable of holding three wheelbarrows loaded with castings. The photograph shows the castings ready to be dumped on a platform over the tumbling mills*

*Hard Iron Department—Compact Arrangement Minimizes the Handling of Castings*

ture to such an extent that the upper part of the stack is never hot enough to glaze the brick, thereby materially increasing the life of the lining.

The melting time of an 18-ton heat is considerably less than that of the average coal-fired furnace, because of greater efficiency in combustion. The experience of the company with oil instead of coal as fuel for the furnace has proved that better control is achieved and time and labor are saved. These items over a long period of time mount to impressive figures from the standpoint of costs. Two men operate the furnace, as against four or five in the case of a coal-burning furnace. Incidentally, the first heat of the day comes off at 10 a.m. and the second at 4 p.m.

### Treatment of Castings After a Heat

Within 30 min. after a heat is poured, all of the castings are broken off the gates, and the sprues and castings are in wheelbarrows placed under a monorail conveyor. From an electrically-operated overhead crane is suspended a special carrier having three hooks and six rings, which picks up the wheelbarrows. One hook is attached to the wheel of the barrow and two rings are slipped over the two handles. In this manner the carrier takes three wheelbarrows loaded with castings, transports them to a platform in the hard iron department and dumps them. The carrier then returns the three empty wheelbarrows to the molding floor. Since wheelbarrows are standard equipment and replacement parts can be purchased in quantities at a low price, this form of container has been given preference over others.

Compactly arranged so that the handling of castings is minimized, the hard iron department has some interesting features. From the platform, which is 8 ft. in height, the castings are dumped into a chute leading directly to the tumbling mills located below and just to one side of the platform. The castings pass into the mills through a hinged door, which is opened and held in position by a small carrier attached to an overhead monorail. The mills are operated by an electric chain drive under the platform.

From the mills the castings are dropped on to tables where they are inspected. Any defective castings are put into wheelbarrows under the tables, while the others are chipped by workmen, who place them on tables immediately behind them, ready for grinding. After the castings are ground, they are again inspected and are counted and weighed. On each casting is the molder's mark, so that it is possible to ascertain the number of castings that each molder produces. The number and weight are recorded on a ticket, from which the molder's pay is computed. One copy of the ticket goes to the office and the other to the molder. In this way each molder knows every day exactly what he has earned on the last heat accounted for, which is usually the third day after the iron is cast. Disputes regarding the amount of work done are thus greatly reduced.

After inspection the castings are placed in annealing pots ready for the annealing operation. Only in case of small castings is packing used, and then only to hold the castings straight for annealing purposes. Castings are not pickled because a rust is set up under the scale which causes the scale to drop off. Moreover, an oxidizing condition is created which may continue indefinitely.

In many foundries silicon and carbon are considered the two most important factors in annealing. Here, however, all elements are regarded as having a direct bearing on the way castings are to be annealed.

When the annealing operation has been completed, a test bar taken from one of the annealing pots is broken. From the appearance of the fracture is determined further progress of the castings. If the anneal has been satisfactory, the castings are dumped from the pots on to the floor, where they are picked up by a magnet and taken to an elevated platform the same height as that in the hard iron department. From the platform they pass to the malleable mills or to the sand blast room, after which operation they are assorted. Stove plate castings go to the straightener to be straightened either by hand or by drop hammer. At this point they pass a final inspection, during which only the surface is examined, and are packed ready for shipment to customers.

### Charges Made Up Mechanically

Materials used in making up charges for the melting furnace are handled mechanically. Pig iron is taken by magnet attached to an overhead crane from

*Patented Special Vent Board Which Eliminates Possibility of Rats and Pin-Holes in Castings. The device consists of a backing device with a number of venting pins or wires*

the receiving bin to bins in the charging department. Here pig iron, sprues and other scrap are picked up by the magnet and are dropped into charging buckets, which are weighed and are carried on a monorail by a bridge crane to the furnace. By following this procedure a crane operator and three other men make up two 18-ton heats daily. Equipment includes a number of buckets in which charges are prepared considerably ahead of the time when they are needed. As a result the average time required to charge the furnace with 18 tons of materials is only 30 min.

For mechanical handling of materials the foundry is served by a monorail crane system on which are operated three hoists with cabs. The operator of the first cab has charge of the east end of the foundry, and it is his duty to transport pig iron from the receiving bins to the charging department and sand to the molding floor. In addition, he makes up the charges and takes them to the melting furnace, bringing back to the charging department wheelbarrows filled with sprues. The operator of the second cab "cleans the floors," distributes sand to the molding floors and carries core racks from the core room to the core setters. The third operator is responsible for transporting castings from the molding floor to the tumbling mills and for loading and unloading the annealing ovens.

### Special Vent Board Features Molding

In the molding department air-operated portable molding machines are used. The gangways between the rows of molding floors are made of concrete for the convenient transportation of the machines. Sand is tested for moisture and for bond, and every casting is faced with a special facing sand, the preparation and testing of which are in charge of one man. All molds have perforated metal bottom-boards to permit the gas to escape through the bottom of the mold. In addition, every molder has a patented special vent board, the application of which eliminates rats and pin-holes in the castings.

This device comprises a board or other backing device, which may or may not be a part of the flask, with a number of venting pins or wires. Made of case-hardened steel, the pins or wires are of varying lengths and are so arranged that the vent holes which they produce are of the proper depth to permit the steam and gas to escape from the mold, all vent holes terminating approximately the same distance from the cavity, even though it may be irregular in shape. When a mold is made on a molding machine the venting pins or wires may be attached to, and movable with, a part of the molding machine. Of paramount importance in connection with the process is the fact that the venting pins or wires are distributed on the board or other backing member to which they are secured so as to produce a configuration corresponding to the shape of the cavity in the mold.

If desired, the venting pins or wires can be attached to the board or other backing member so that they can be individually removed. By this arrangement certain of the pins or wires can be located at various angles to avoid such conditions of the mold as blows. In this case the angularly-arranged pins or wires can be individually removed from the board before it is withdrawn from the mold.

All molders wear white duck pants and the foremen of the molding floors are in white union-alls. When pouring iron, the molders are required to don canvas leggings. The clothing is laundered weekly by the company and at its expense.

### Avoiding Excessive Handling of Cores

In the core room large racks are placed immediately behind the core makers. The green sand cores are put on the racks which, after being filled, are picked up by lift trucks and placed in gas-fired core ovens, of which there are four. When the cores are properly baked,

the racks are removed from the ovens by lift trucks and are put under the crane runway, where they are picked up by monorail hoists and are carried to various parts of the molding floor. After the cores have been taken from the racks by the core setters, the empty racks are returned by the monorail hoists to the core room, where they are again placed behind the core makers, to be refilled. By following this method, the company has avoided unnecessary handling of cores by the workmen. An exception is made in the case of cores to be delivered to nearby parts of the molding floor, transportation being by means of stretchers instead of racks, carried by air hoists.

The entire foundry consists of a large area without partitions. This arrangement is advantageous in giving supervising officials an opportunity to see in a moment what is going on in any part of the plant. Furthermore, the absence of partitions conserves floor space and thereby cuts down plant investment.

### Can Make Own Power in Emergency

Unless some adequate provision is made for meeting emergencies, companies depending upon outside sources for power are likely to experience much difficulty and considerable loss in case of a breakdown. Anticipating such a situation, the company has established adjoining its foundry a small power house equipped with a Diesel engine (manufactured by the Busch-Sulzer Brothers Diesel Engine Co., St. Louis) and an 85-kw. generator set. This electrical unit is for use in completing a heat in case trouble develops in the outside power line. In fact, the value of this reserve unit has already been proved, for on several occasions work would have had to be suspended if the emergency equipment had not been available.

The Southern Malleable Iron Co. is the only manufacturer of malleable iron using the single-heat annealing ovens described. V. S. Durbin, manager, states that the company's method of determining the percentage of anneal or the amount of combined carbon not only is new, but also is probably the only accurate way of finding out the percentage of the anneal. The value, he says, lies in the fact that practically no losses have been incurred in the form of defective castings, and that the quality of the castings has been above the average. In connection with the new practice of making malleable iron, the company has a number of patents pending.

## Continuous Furnace to Heat 50 Tons of Billets an Hour

The continuous furnace to serve the continuous mill being built for the Timken Roller Bearing Co., Canton, Ohio, by the Mesta Machine Co. will be furnished by the Rust Engineering Co., Pittsburgh. The heating hearth will be 33 ft. wide by 51 ft. in length. The furnace will have an output of 50 gross tons of billets an hour, varying in size from 2 x 2 in. to 5 x 5 in., and 30 ft. in length. To give this high tonnage, billets will be charged in the side, pushed the length of the heating hearth and discharged from the opposite side of the furnace directly into the first stand of the continuous mill. The fuel to be used will be natural gas. Combustion control and draft regulation equipment will be furnished by the American Heat Economy Bureau, Pittsburgh.

## Electric Steel Staybolts Tested in Locomotive Service

To test out staybolts made of electric steel, in comparison with those made of charcoal iron, the Atlantic Coast Line Railroad fitted one side of the fire box of engine 921 with the one type of staybolt and the other side of the same fire box with the other type. This installation was made in May, 1922, the staybolts of both types being the product of the Old Dominion Iron & Steel Works, Richmond, Va. Periodical reports made by the general superintendent of motive power of the railroad have shown how these different types of staybolts have stood up in service. In the table are listed the number of bolts which had to be removed up to various dates, the latest being Jan. 31, 1928.

| Removed Prior To | Charcoal Iron | Electric Steel | Ratio |
|---|---|---|---|
| Jan. 1, 1925..... | 32 | 11 | 2.9 |
| July 1, 1927..... | 51 | 15 | 3.4 |
| Jan. 31, 1928..... | 65 | 16 | 4.1 |

*Core Room—Large Racks, Which Are Lifted by a Jack-Lift Truck, Are Placed Immediately Behind the Core Makers*

# Sandless Foundry Makes Progress

## Plant of Holley Carburetor Co., Detroit, Has Developed Long-Life Mold Production Successfully—Large Output Obtained in Relatively Small Space With Unskilled Labor

BY HARRY KIMBER*

*THE adoption of the long-life or permanent mold by the Holley Carburetor Co., Detroit, was the subject of a paper read by Dr. Richard Moldenke before the 1923 convention of the American Foundrymen's Association in Cleveland and published in* THE IRON AGE *of May 3, 1923, page 1251. In the following article written for* THE IRON AGE *the author, a member of the Holley organization, describes the results which have been achieved by the use of the long-life mold and the improvements which have been developed in practice and in the design of the machines used.—EDITOR.*

THE Holley Carburetor Co. of Detroit was one of the first of the automobile carburetor manufacturers to produce carburetors having cast iron bodies. Great difficulties were experienced in securing sand castings that were impervious to gasoline and commercially machinable, because of extremes in cross-section in these 2-lb. castings. Malleable iron castings and box annealed semi-steel castings were tried with fair success, but were not comparable with gray iron when price, machinability and appearance were considered.

The demand for this particular carbureter increased steadily, while fewer foundries were available that could produce satisfactory castings, until only one foundry remained as a dependable source of supply.

The management decided that the permanent or long-life mold was a possible way out of this uncomfortable situation, and experimental work began in 1922. They knew that an unprotected cast iron mold was impractical; so an intensive search was soon under way to find a suitable protection for such a mold. Many coatings were tried before the satisfactory combination was discovered. This refractory coating, which is cheap, easy to prepare, easy to apply and permanent, made the Holley long-life mold a definite success. Production was begun at once on the above-mentioned carbureter casting, and when it was finally discontinued over 7,000,000 castings had been produced in Holley molds in a little over two years.

### Adopted by Ford Motor Co. and Others

Henry Ford became interested in this mold and the automatic machine which was developed to carry it. The Ford Motor Co. now has nine of these machines in its foundry, producing hundreds of thousands of small gray iron castings for the Model A car and pistons for the Fordson tractor. Thousands of cast iron pistons were also made for the Model T car by this process. The carbureter body for the Model A is now being produced in large quantities on these machines in the Holley Carburetor Co.'s new sandless foundry.

The production possibilities of this machine were soon recognized by manufacturers and foundrymen both in this country and in Europe, and many of them now are using the machines in their own foundries. The Delco Remy Corporation, a subsidiary of the General Motors Corporation, is completing plans for the erection of a new 100-ton sandless foundry at Anderson, Ind.

Castings ranging from 6 oz. to 25 lb., thick and thin, and with and without cores, are now being produced in large quantities in the Holley molding machines.

The Holley foundry is a two-story steel and concrete building, having the core room and the molding department on the second floor, and the annealing, cleaning and inspection on the ground floor. A balcony, 12 ft. wide, extends over the entire length of the core room. All of the core sand is mixed on this balcony and delivered to the coremakers' benches by means of hoppers. All high-production cores are made on core-blowing machines, and every core used is treated with a core wash.

There is one No. 6 Whiting cupola lined to 46 in. in operation. The building was designed, however, for two cupolas and mechanical charging.

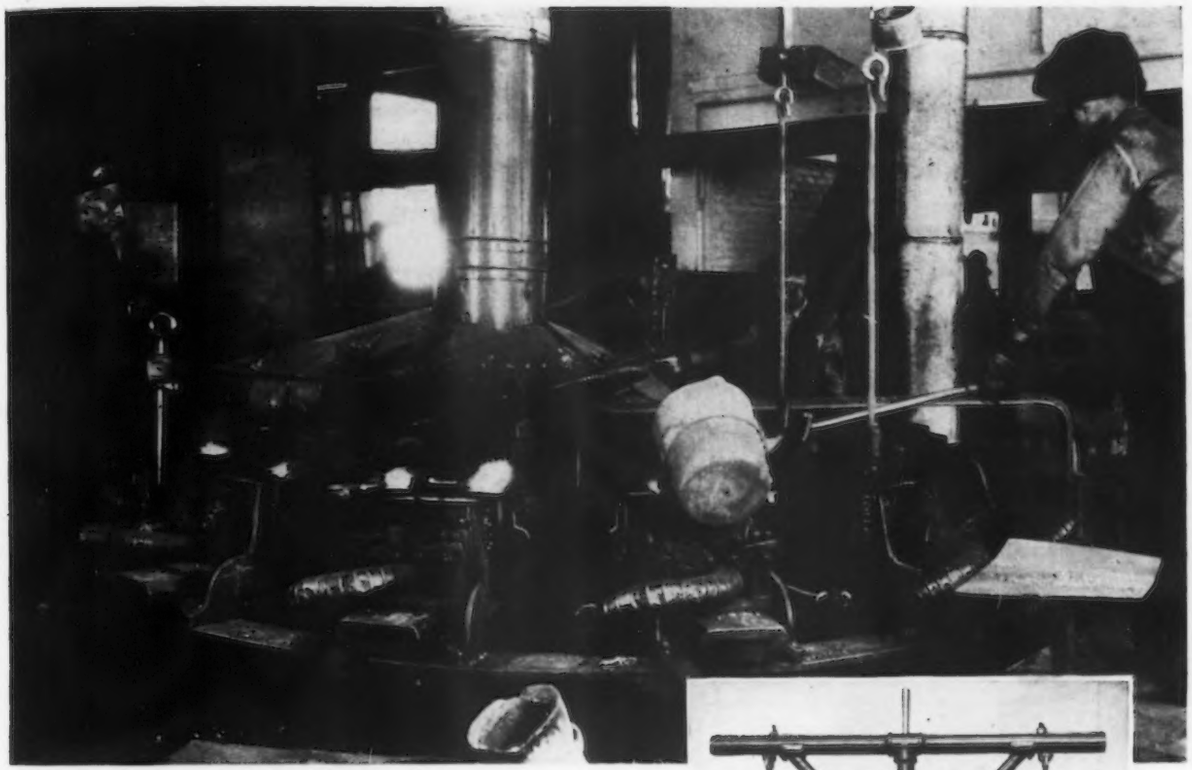
The molding department, which is 48 x 84 ft., contains eight automatic 12-headed rotating machines and eight No. 3 single-headed machines, which are manually operated. The molten iron is delivered to these machines with 300-lb. bull ladles, which travel on an overhead monorail. The hand ladles are suspended in pairs from a specially designed mast in such a manner that one ladle may be filled from the bull ladles while the operator is filling molds with the other. In this way the operator always has a hand ladle full of iron ready for him when the one that he is using becomes empty.

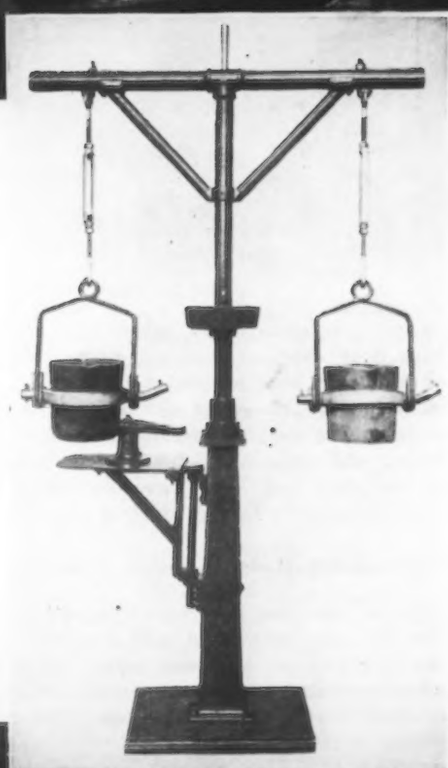
### Automatic Turntable Carries 12 Molds

The automatic machine consists of a turntable carrying 12 molds. It rotates intermittently with an indexing time of approximately 3 sec. The operator at the knockout position starts the machine to rotating, but it stops automatically by means of a trip switch. The molds are poured while the machine is stationary.

The mold is first cleaned by a blast of compressed air and is then re-coated with a fresh coating of lamp black for every casting. This is accomplished with a specially designed cleaner and acetylene burner. After passing this burner, the cores are put in place by an operator and the table continues to rotate until the mold arrives at the pouring station. When the pouring, which takes from 5 to 7 sec., is completed, the operator pushes a button and the next mold moves round to the pouring station. The mold that is full of iron continues around to a certain point, where it opens, and the casting, which has set but is still red hot, is ejected. This casting drops into a hopper in the floor on to an inclined chute which delivers it to a continuous pusher-type, gas-fired annealing furnace on the first floor beneath. It enters directly into the furnace at a temperature of approximately 1000 deg. Fahr. and is rapidly brought

*Holley Carburetor Co., Detroit.





*POURING Molds on a 12-Headed Holley Molding Machine (Above). The machine carries 12 permanent molds and rotates intermittently with an indexing time of about 3 sec. On one of these molding turntables 7500 1¼-lb. castings are being produced in 8 hr. The curved pipes shown carry air to the molds to control the temperature. The blower is arranged so that heated air is blown on the molds in cold weather, while air is drawn over them and exhausted out of the building in hot weather*

*Molds Are Poured from Hand Ladles Suspended from a Mast and So Arranged That One Ladle Is Being Filled from a Bull Ladle While Molds Are Being Filled with the Other Ladle (Right)*

*Some of the Larger Castings, Such as Tractor Manifolds, Are Made on a Single-Headed Manually Operated Machine (Below)*

up to 1600 deg. Fahr. It is held at this temperature for 20 min. and is allowed 1 hr. to cool to 900 deg. Fahr., when it leaves the furnace to be tumbled, snagged and sand blasted. After the final inspection it is ready for shipment.

### One Machine Produces 7500 Plain Castings Per 8-Hr. Day

One of these automatic 12-headed machines is producing 7500 1¼-lb. castings (without cores) while another is producing 4000 4¼-lb. cored castings in 8 hr., with an average scrap loss of considerably below 10 per cent. The molds in both cases are designed for two castings.

The No. 3 manually operated machines are used in the Holley foundry for the production of the Ford tractor manifold, with the intake and exhaust cast together. One operator produces 200 of these 22-lb. castings in 8 hr. with two machines. He cleans and soots the mold and sets two cores for each casting. One pourer services four machines.

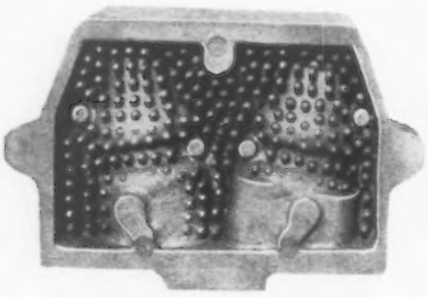
This means that two operators and one pourer produce approximately 5 tons of cored castings in 8 hr.

The molds are cast to size and require very little machining. After the machine work is completed, they are heated to about 500 deg. Fahr., and the refractory coating is applied to the face of the mold with a soft brush. As previously stated, this coating is permanent, but it does wear off in places where there is only a slight draft and in the sprue. These spots are touched up at the end of the day's run while the molds are still hot. Care of the molds is a most important, though simple, task.

At the beginning of the day the molds are heated with gas to a temperature of 500 deg. Fahr. before the first castings are poured. From then on the pouring is continuous throughout the day, except when the crew is out to lunch.

### Cupola Practice Follows General Production Foundry Methods

The cupola practice, therefore, is the same as in that of any other production foundry. The first iron is tapped at 7.30 a. m., and the melting is continuous until 4 p. m., when the bottom is dropped. The tuyeres are cleaned out twice during this period, and the slag



*TO Control the Temperature of the Permanent Molds Numerous Pins Are Cast on Their Back Surfaces, and Over These Low-Pressure Air Is Passed During Pouring Operations*

These castings are quite bulky, and therefore occupy considerable floor space in a sand foundry. The four machines occupy an area of 200 sq. ft. of floor space.

The cost of these 12-headed and the hand-operated machines compares very favorably with the cost of sand-handling and pattern equipment and completely eliminates the mold and sand conveyors which are a necessity in the modern high-production sand foundry.

### Improvements Made in Recent Machines

A number of machines have been designed and built during the last five years, and with each succeeding design, an improvement has been made. Water and oil as cooling mediums were experimented with, but air was finally selected because of its safety, efficiency and the simplicity of its application.

The rotating 12-headed machine has recently been redesigned and is now under construction. It is a decided improvement over the machines now in service.

The molds now in use are cast in dry sand molds with the same iron as that used for the castings. These molds have a multiplicity of pins cast on the back, and, when mounted on the machine, low-pressure air is passed over these pins at the rate of 100 to 200 cu. ft. per min. The volume of air is regulated so that the temperature of the mold remains within a certain range. One of the pictures shows the pipes that carry this air to the molds. The blower is overhead along the wall of the building, and is arranged so that the air blows on the molds in cold weather, and is drawn over them and exhausted out of the building in hot weather. This takes care of the heating and ventilating of the foundry very satisfactorily.

A series of tests with molds cast of various alloy irons is now in progress but will not be completed for some time. However, with proper control of the cooling system, ordinary gray iron molds have an average life of 15,000 castings on the automatic machines.

hole is kept open from 10 a. m. until the bottom is dropped in the afternoon. The blast pressure is 12 oz. No mixing ladle is used, but the cupola bottom is designed to hold about 3 tons of molten iron. This enables the cupola tender to supply the traveling bull ladles at all times. The charging is done by hand and every charge is weighed.

The charge is as follows:

| | |
|---|---|
| Pig iron | 500 lb. |
| Scrap | 500 lb. |
| Limestone | 75 lb. |
| Coke | 150 lb. |

The analysis of the resulting cast iron is as follows:

| | Per Cent |
|---|---|
| Total carbon | 3.50 |
| Silicon | 2.50 |
| Sulphur | 0.090 |
| Phosphorus | 0.330 |
| Manganese | 0.55 |

No alloys or special fluxes are used at any time. The slag is greenish gray in color, indicating proper melting conditions in the cupola.

Production has not been interrupted because of cupola trouble in more than two years, a record of which the management is very proud. The average daily melt is 45 tons for 8½ hr. Between 11 a. m. and 12.30 p. m. the wind is off for a part of the time while the various machine crews are taking their half hour for lunch.

Test bars are poured off four times a day; at 9.30 and 11.30 a. m., and at 2 and 4 p. m. These bars are Brinelled and analyzed daily.

To determine the effect that the Holley mold has upon cast iron, American Society for Testing Materials standard test bars were cast in both green sand and a Holley mold from the same ladle. Those cast in the Holley molds were given the regulation annealing. Some of each of these bars were sent to several different testing laboratories, and their reports were almost identical. In every case and in every test the

sand castings were inferior. A summary of these tests follows:

| Type of Test | Sand | Holley |
|---|---|---|
| Brinell No. | 184 | 179 |
| Transverse strength in lb. (12-in. centers) | 3,083 | 5,024 |
| Tensile strength (standard A.S.T.M. 8-in. bar), lb. per sq. in. | 20,970 | 26,980 |
| Impact on Olsen machine, ft.-lb. | 37 | 67 |

**Formation of Large Graphite Flakes Prevented**

When one stops to consider, this great difference in physical properties is to be expected. The rapid rate of cooling produces a very fine grain structure and prevents the formation of large graphite flakes. Carbon has an atomic number of 12 as compared with 56 for iron. In other words, a unit weight of carbon will occupy almost five times the space of the same unit weight of iron. This means that an enormous pressure is generated within the casting itself when the graphite begins to separate out at the instant of solidification. This also prevents the formation of large crystals and graphite flakes and eliminates internal shrinks. The subsequent annealing relieves all casting strains, and, as a final result, the finished product has qualities which enable the machine shop to increase production from 10 to 20 per cent. It is this saving, added to the saving in producing the castings, which has justified the Holley Carburetor Co. in spending the time and money in the development of this process.

The outstanding features of the Holley process are a very large production in a relatively small space with unskilled labor. The resulting castings are stronger, easier to machine, freer from blow holes, shrinks and sand, and cost less to produce than sand castings.

In general, the Holley process lends itself to the modern trend toward mass production.

# Materials Handling by a Variety of Methods

## Engineers Discuss Cost Saving Features of Special Shipping Containers—Pneumatic Systems

HANDLING of materials by transportation entities occupied the attention of the Philadelphia meeting of the Materials-Handling Division of the American Society of Mechanical Engineers at the morning session of April 24. Three papers were scheduled, of which only two were delivered. The paper "Store-Door Delivery of Freight by Motor Trucks," by F. J. Scarr of the Scarr Transportation Service, New York, was deferred because of Mr. Scarr's illness. Two papers read included "Modern Handling Methods in Railroad Transportation," by G. C. Woodruff, assistant freight traffic manager New York Central Railroad, and "Materials Handling on Steamship Piers at Home and Abroad," by Willard C. Brinton, president Terminal Engineering Co., New York. Mr. Brinton's paper was illustrated by lantern slides, which he discussed at some length as they were shown.

Two sessions in the afternoon were devoted respectively to interior handling and to bulk handling (coal, ore, ashes, etc.). "Modern Handling in Enameling Work," by Edwin P. Smith, will appear in an early issue of THE IRON AGE. "Pneumatic Handling of Materials," by Harry S. Parks, follows, in abstract.

### *Pneumatic Handling of Materials*

LANTERN slides featured the presentation of a paper by Mr. Parks, who is engineer of the Holly Pneumatic Systems, New York. The paper traced something of the history of the development of the pneumatic method, before going into the details of the Holly system. The author defined pneumatic conveying as a system "of a high-velocity stream in which the material conveyed is suspended."

Generally speaking, Mr. Parks was not inclined to place a limit on the distance material could be transported by this means. Practically, however, the systems are usually not over 350 to 400 ft. in length unless there is a booster inserted. Occasionally, however, a line as much as 800 ft. long is used. The vacuum system consists of a suction nozzle, a pipe line, a recipient, a discharging device which extracts the material from the air stream without breaking the vacuum. Suitable apparatus must be provided for cleaning from the air stream all finely divided material and thus preventing it from carrying over into the vacuum equipment.

**Advantages of the System**

Such a system of handling is not only extremely flexible, but makes possible a wide variety of combinations. Among the particular advantages of pneumatic conveying may be enumerated labor saving, dustless operation, low upkeep in maintenance costs, and ease of installation. There are no shovelers or other manual laborers. One man can handle all the material direct, without intermediate handling. Being nothing but a pipe line, a pneumatic conveyor can bridge gaps resulting from the plant layout.

There is no dust in pneumatic handling. It thus eliminates unhealthful working conditions and prevents a great amount of waste and spoiled material. In many cases it ends a serious fire hazard. Where handling combustible materials, however, pneumatic systems must be adequately protected by suitable grounding against static sparks.

As there are few moving parts in the system, maintenance costs are reduced to a minimum. As the material is suspended in the center of the channel of flow, it does not come in contact with the conveying line, except at the elbows or turns. Here the wear is confined and replacement of worn elbows is provided for in the design. Even then the wear is not serious, except in handling abrasive substances.

Ease of installation is promoted by the fact that a pneumatic conveying system is almost wholly a pipefitting job. The principal equipment is easily located and takes little floor space. The conveying lines can be laid out over or under roadways, up the side of a building, or through it, or wherever required.

## Heating Automobile, Furniture Sheets by Continuous Pack Method

Continuous pack heating of sheets is to be done in a new furnace now under construction at the plant of the Newton Steel Co., Newton Falls, Ohio. The Rust Engineering Co., Pittsburgh, is making the installation, which, it is expected, will be completed and in operation in about six weeks. Continuous pack heating of tin plate gages of sheets has been practised, but this will be the first application of the method to sheets, and in this case to automobile body and metal furniture sheets, the principal tonnage of the Newton company. The new furnace is 5 ft. wide and approximately 47 ft. long inside, and will have an output of 30 tons a shift. The packs are carried through the chamber on Kathner-type disk rolls, manufactured by the Duraloy Co., Pittsburgh. Producer gas is the fuel. Preheated air is to be supplied by an alloy metal recuperator.

W. S. MOSHER, SR.
*Vice-President, 1896-1900*

I. W. FRANK
*Vice-President, 1897-1898*

HOWARD EVANS
*Treasurer, 1896-1900*

# Living Founders of A. F. A.

A. I. FINDLEY
*Vice-President, 1902*

*Some of the men who became officers after assisting in organizing the American Foundrymen's Association*
(*See article on page* 1265)

JESSE JONES
*Director, 1926 to 1928*

S. D. SLEETH
*Vice-President, 1901*

STANLEY G. FLAGG
*President, 1907-1908*

## 1896-1928

S. T. JOHNSTON
*Vice-President, 1908 and 1927-28*

JOHN A. PENTON
*Secretary, 1896-1899, Vice-President, 1900*

WALTER WOOD
*Vice-President from 1909 to 1916*

A. W. WALKER
*President, 1902-1903*

# *American Foundrymen's Association to Meet in Philadelphia, May 14*

THE American Foundrymen's Association will hold its convention and exposition of foundry equipment and supplies in Philadelphia during the week of May 14. The exhibits will be in the Commercial Museum, where will be assembled many new and improved machines for the modernization of the foundry and also the time-tried equipment developed in recent years.

This will be the first exposition of the American Foundrymen's Association since that held in Detroit in September, 1926, and in the interim progress has been made in many lines associated with improvement in foundry practice.

A feature of this issue of THE IRON AGE is the presentation on pages which follow of installations of equipment that have brought up the standard of foundry work, or have increased production and reduced costs. Illustrations of some of the new equipment to be exhibited at Philadelphia are also to be found in this issue.

## *List of Exhibitors and Products They Will Show*

A

**Abrasive Co., Philadelphia. Booth Nos. 136, 138.**
Demonstration of snagging wheels, including the Red Center Borolon Bakelite, Borolon Vitrified, Electrolon Bakelite and the K Bond Electrolon. Representatives attending: Samuel M. Hershey, L. R. Burnes, E. M. Wilkinson, J. F. Fischer, R. A. Shaffer, W. A. Ruppel, I. R. Blair.

**Adams Co., Dubuque, Iowa, Booth No. 131.**
Adams jolt squeezers, pneumatic sand riddle, cherry snap flasks, cherry slip flasks, steel jackets, steel bands, vibrators, rappers, sprue cutters, etc., steel bottom plates. Representatives attending: Waldo Adams, Lester Demkier, W. J. Spensley, John Cameron.

**Air Reduction Sales Co., New York. Booth Nos. 489-491.**
Airco 99.5 per cent oxygen, Airco acetylene, Airco National Carbide and Airco Davis-Bournonville apparatus for oxyacetylene welding and cutting; Argon, Neon, Helium and other rare atmospheric gases; demonstrations with hand welding and cutting outfits, and the Radiagraph and Oxygraph, motor driven machines for oxyacetylene cutting. Representatives attending: W. W. Barnes, W. H. Eliason, H. B. Hand, J. F. High, C. D. Trout, W. L. Humphreys, F. Judelsohn, C. S. Peters, H. L. Rogers, R. F. Helmkamp, and G. Van Alstyne.

**Ajax Electrothermic Corporation, Trenton, N. J. Booth No. 484.**
A 3 kv.-a. Ajax-Northrup high frequency induction furnace melting steel, copper, etc., and a model of a 500 lb. high frequency furnace for steel melting. Representatives attending: G. H. Clamer, president and general manager; Dr. E. F. Northrup, vice-president and technical adviser; Dudley Willcox, secretary and treasurer; R. N. Blakeslee, F. T. Chesnut.

**Ajax Metal Co., Philadelphia. Booth Nos. 481, 482, 483, 484.**
Brass and bronze ingot metals, also castings produced by customers from these ingots; Ajax process babbitt metals; Ajax-Wyatt electric furnace; types of Ajax-Northrup electric furnace and accessories. Representatives attending: G. H. Clamer, president and general manager; W. J. Coane, first vice-president and general sales manager; Frank M. Willeson, Zeno D. Barns, A. MacDougall, J. Millson Graham, S. E. McClure, J. C. Brightbill, R. J. Keeley, J. R. Wyatt, Henry Gleseke, William Adam, Dr. Edwin F. Northrup, Dudley Wilcox, R. N. Blakeslee.

**Albany Sand & Supply Co., Albany, N. Y. Booth No. 344.**
Foundry sand.

**Alloys and Products, Inc., New York. Booth No. 291.**
Deoxidizers, densifiers, hardeners, technical alloys, rich alloys and special alloys in ingot, shot and lump form. Representatives attending: Henry Hecht, president; Charles Vickers, Adam J. Hecht, Frank J. McCaul, Gilbert T. Mason, John A. Fletcher, William J. Bullock, Charles J. Harney, E. E. Berliner.

**Alpha-Lux Co., Inc., New York. Booth No. 2.**

**American Boron Products Co., Inc., Buffalo. Booth No. 216.**
Boronic alloys. Representatives attending: J. B. Mendenhall, W. A. Sharp, R. E. Molley.

**American Brake Shoe & Foundry Co., Chicago. Booth No. 8.**

**American Engineering Co., Philadelphia. Booth Nos. 105, 107, 109.**
A 220-volt, d.c., 1-ton plain trolley hoist with foundry control; a 220-volt, 3-phase, 60 cycle, a.c., 2-ton hoist with 2-speed control, cage controlled, with fully inclosed motor driven trolley and 2-speed squirrel cage motors on both hoist and trolley; new pressed steel ¼-ton hoist recently added to the Lo-Hed line in three types; with plain trolley, with bolt suspension, with hook suspension; other Lo-Hed monorail hoists and a stationary hoist. Representatives attending: R. H. McGredy, J. M. Combs, George L. Drake, W. A. Hummel.

**American Foundry Equipment Co., Mishawaka, Ind. Block Q.**
Complete line of foundry equipment, including sand-cutting machines, flasks, sand-blast equipment, rod straighteners and shears, core machines, tumbling barrels, dust arresters and incidental equipment. Also a new tumbling barrel and the new American Preparator, a sand preparing machine.

**American MonoRail Co., Cleveland. Booth Nos. 334, 336.**
Overhead MonoRail conveying equipment. Consisting of overhead MonoRail tracks, trolleys, switches, cranes, chain hoists, electric hoists. Representatives attending: L. E. Gaston, J. W. Clokey, F. C. Harris, J. P. Lawrence, H. M. Miller, B. D. Jeffs.

**American Saw Mill Machinery Co., Hackettstown, N. J. Booth No. 195.**

**American Steel Abrasives Co., Galion, Ohio. Booth No. 299.**
Samples of American "Eversharp" steel grit, and American standardized steel shot; metallic abrasives for use in blasting equipment for the cleaning of castings, forgings, heat treated parts, etc. Representatives attending: L. A. Cline, president and treasurer; S. D. Layton, vice-president and general manager; Ira T. Armstrong.

**American Vent Wax Co., Lockport, N. Y. Booth No. 210.**
Vent wax. Representative attending: N. L. Nankey.

**Ames Shovel & Tool Co., Boston. Booth No. 289.**
Shovels. Representatives attending: N. E. Brooks, Maynard Swift.

**Arcade Mfg. Co., Freeport, Ill. Booth Nos. 383 to 387.**
Power moderns—jolt, rollover, squeezer, pattern draw; hand moderns—rollover, squeezer, pattern draw; jolt stripper, air stripper, jolt squeezer, jolt squeezer (heap straddler), core machines, pouring devices. Representatives attending: L. L. Munn, vice-president and general manager; B. C. Trueblood, treasurer; Mentor Wheat, sales manager; Henry Tscherning, V. S. Firestone, August Christen, R. E. Turnbull, Herman Kasten, G. D. Wolfley, Herman Meyers, William Herman.

**Asbury Graphite Mills, Asbury, N. J. Booth No. 81.**

*C. H. Clamer*
**Ajax Metal Co., Philadelphia. Chairman, General Committee**

*W. J. Rice*
**Ajax Metal Co., Philadelphia. Secretary, General Committee**

*Laird U. Park*
**Park & Williams, Inc., Philadelphia. Chairman, Reception Committee**

**Austin Co., Cleveland. Booth Nos. 83, 84.**
The Austin method as applied to the development and construction of complete foundries shown by means of models, photographs, plans and reports. Use of labor-saving devices and material-handling equipment also will be featured. Representatives attending: G. A. Bryant, vice-president and sales manager; H. E. Stitt, O. D. Conover, J. C. Childs, Charles E. Covell, E. F. Scott.

**Automatic Transportation Co., Buffalo. Booth Nos. 315, 317.**

**Axmann Sand-Throwing Machine Co., Cleveland. Booth Nos. 72, 74.**
Axmann sand-throwing machines in operation, conditioning sand, filling overhead sand bins, conveying sand from one location to another, etc. Representatives attending: S. L. Dryfoos, vice-president and general manager; Eric Wisbrun, C. M. Holcomb, E. J. Welter, M. A. Beltaire, Jr.

**Ayers Mineral Co., Zanesville, Ohio. Booth No. 257.**

B

**The Baker-Raulang Co., Cleveland. Booth No. 312.**
Baker electric locomotive-type crane, 3000-lb. capacity at a 7 ft. radius; Baker electric hy-lift truck, 60-in. lift, 6000-lb. capacity; Baker series D 3-ton elevating truck, special foundry type. Representatives attending: H. B. Greig, C. H. Remde, D. L. Darnell, H. W. Faunt Le Roy, S. M. Conant, Nathaniel Platt, H. C. Sherer.

**C. O. Bartlett & Snow Co., Cleveland. Booth Nos. 401, 403, 466, 468.**
Continuous sand blender, pug mill, conditioner, elevator, conveyor parts, photographs of installations of continuous molding and pouring equipment, moving picture of large production foundry operation. Representatives attending: H. L. McKinnon, secretary; H. C. Orr, M. E. First, W. W. Dodge, W. H. Norrington, Oliver S. Kelly, C. W. Ross.

**H. L. Baumgardner Corporation, Chicago. Booth Nos. 405, 470.**

**Bausch & Lomb Optical Co., Rochester, N. Y. Booth No. 201.**
Optical and scientific instruments, photomicrographic apparatus and microscopes, toolmaker's microscope, optical index device for dividing head, diamond tools, thread profile gage, magnifiers and readers, etc. Representatives attending: I. L. Nixon, J. A. Scheick, E. H. Anthes.

**Beardsley & Piper Co., Chicago. Booth Nos. 407, 409, 411, 413, 415, 472, 474, 478, 480.**
Sandslingers.

**Berkshire Mfg. Co., Cleveland. Booth No. 450.**
Molding machines and vibrators, jolt squeezers, plain squeezers, pattern draw machines, aluminum flasks. Representatives attending: Guy L. Cameron, H. F. Henriques.

**Bethlehem Steel Co., Bethlehem, Pa. Booth Nos. 239, 292.**
Automobile engine block, carbureter casting, electric refrigeration cylinder casting, a number of small intricate die castings, and other castings, all made with Mayari pig iron. Representatives attending: Messrs. MacDonald, Fisher and Pritchard, and representatives from Bethlehem district offices in Boston, New York, Philadelphia, Pittsburgh and Baltimore.

**Biax Flexible Shaft Co., New York. Booth No. 370.**

**Black Diamond Saw & Machine Works, Natick, Mass. Booth No. 179.**

**Black & Decker Mfg. Co., Towson, Md. Booth Nos. 27, 29.**

**Blaw-Knox Co., Pittsburgh. Booth No. 93.**
Blaw-Knox clamshell buckets, steel grating and open flooring, air preheaters, standard steel buildings, Tracy-fiers (steam purifiers). Representatives attending: E. L. Harrington and J. W. Hemmerle.

**Bloomsbury Graphite Co., Bloomsbury, N. J. Booth No. 241.**
Foundry facings, Ceylon plumbago, plumbago blacking, Ceylon silver lead, plumbago core wash; all grades Ceylon graphite. Representatives attending: Edwin R. Wolverton, vice-president and general manager; M. F. Murphy.

**Botfield Refractories Co., Philadelphia. Booth No. 430.**
Adamant fire brick cement, brick, Adachrome, Adachrome-fines, Adapatch. Representatives attending: W. B. Smith, S. C. Lott, Ires Prosser, J. J. Sweeney.

**Box Crane & Hoist Corporation, Philadelphia. Booth Nos. 96, 98.**
Type "C" heavy duty standardized crane trolley 10-ton capacity; type "BR" hand operated crane trolley; load lifter electric hoist; type "L" electric hoist for alternating current operation and equipped with foundry control; type "L" electric hoist combined with motor operated trolley for running on I-beam track. Representatives attending: George A. Mitchell, secretary and sales manager; Arthur E. Hogrebe, C. Henry Schramm, Harold W. Noble, Myles W. Jones.

**Bradley Washfountain Co., Milwaukee. Booth No. 112.**
One 54-in. type "D" (foot-controlled) white marmorite circular Bradley washfountain. Representative attending: Alec Hicks.

**Brown Instrument Co., Philadelphia. Booth No. 259.**
Temperature measuring equipment for core drying; indicating and recording pyrometers for annealing malleable castings, etc.; cupola thermocouple assembly for recording molten iron temperatures; quick temperature reading of non-ferrous molten metal temperatures; equipment for economically controlling galvanizing temperatures; Brown electric flow meters to be shown for first time to the foundry field. Representatives attending: R. P. Brown, president; G. W. Keller, sales manager; J. P. Goheen, secretary; L. M. Morley, Mr. Lukens, Mr. Knoblauch.

**Buckeye Portable Tool Co., Dayton, Ohio. Booth No. 395.**
Complete line of portable tools, including drills, grinders, sanders, screw drivers, nut setters, etc. Representatives attending: W. R. Gummere, H. O. Gummere, G. A. Barden.

C

**Campbell-Hausfeld Co., Harrison, Ohio. Booth Nos. 311, 313.**

**Carborundum Company, Niagara Falls, N. Y. Booth Nos. 267 to 273.**
Abrasive division: A complete line of snagging wheels for the foundry trade, including Carborundum and Aloxite wheels and high-speed wheels in Redmanol and rubber bonds. Representatives attending: S. F. Courter, general sales manager; W. J. Griffith, G. T. Kretschmar, E. C. Maguire, H. L. Henszey. Refractories division: Small core oven with part of one side and front removed to show method of applying Carboradiant chambers; model of malleable iron annealing furnace; sectional Carborundum lid and lining for brass melting pit furnaces; sample jars of Carborundum No. 3 cement and Firefrax cements Nos. 1 and 2. Representatives attend-

*C. F. Hopkins*
**Ajax Metal Co., Philadelphia. Member Reception Committee**

*R. B. Schaal*
**Roberts & Mander Stove Co., Hatboro, Pa. Member Reception Committee**

*G. H. Rausch*
**Whitehead Metal Products Co., Philadelphia. Member Plant Visitation Committee**

ing: C. E. Hawke, general sales manager; J. G. Fritzinger, J. A. King, F. W. Miller, E. W. Woodruff, S. A. Fenno. Globar division: A small pot type non-ferrous melting furnace; display of a high temperature furnace showing Globar heating elements and terminals in actual operation. Representatives attending: H. N. Shaw, Arnold Pfau, Jr.

**Carr Fastener Co., Dot Lubrication Division, Cambridge, Mass. Booth No. 167.**
Industrial lubrication devices for bearings of machinery used in foundry industry; Dot guns and nipples, Dot-O-Matic pressure cups, electric lubricator, Dot lubricant; also Dot lubrication as standard equipment on the Sandslinger exhibited by Beardsley & Piper Co., on Simpson mixer manufactured by National Engineering Co., and on sand blast mill of W. W. Sly Mfg. Co. Representatives attending: Louis H. Hein, C. L. Hall, P. K. Niven.

**Chicago Crucible Co., Chicago. Booth No. 207.**
Graphite crucibles and refractories; special refractory shapes. Representatives attending: W. MacFadden, vice-president; T. W. Jones, Barney Bernbaum, J. K. Moses, Frank P. Maujean, Leo A. Behrendt.

**Chicago Pneumatic Tool Co., New York. Booth Nos. 30 to 36.**
An air compressor, chipping hammers, sand rammers, riveting hammers, air grinders, pneumatic drills, pneumatic wood-borers and air hoists; also Hicycle electric grinders, drills, reamers, nut runners and a Hicycle frequency changer. Representatives attending: A. E. Goodhue, Huvane, T. P. Harris, Eissler, Estergreen, P. J. Christy, H. G. Barbee, L. J. Walker, A. C. Andresen, Straub, A. M. Brown.

**Chisholm-Moore Mfg. Co., Cleveland. Booth No. 363.**
"C-M" electric hoist; Cyclone high-speed, spur-geared chain hoist; new improved ball bearing Model "K" I-beam trolleys, overhead traveling cranes, cupola charging equipment. Representatives attending: J. R. Mears, sales manager; F. F. Seaman, W. H. Morgan, E. S. Ludlow, G. L. Hunt.

**Clark Tructractor Co., Battle Creek, Mich. Booth No. 53.**
Clarktor sand digger exhibited for the first time. Representatives attending: R. J. Burrows, president; E. W. Clark, vice-president; D. D. Burnside, A. S. Rampell.

**Clearfield Machine Co., Clearfield, Pa. Booth Nos. 393, 395.**
Machine for mixing, tempering, and bonding foundry sand. Representatives attending: P. B. Reed, general manager; J. M. Gallaher, W. E. McMurray, C. D. Johnson.

**Cleveland Electric Tramrail Division, Cleveland. Booth Nos. 22 to 26.**
A working exhibition of Tramrail equipment especially adapted to foundry uses, consisting of necessary crane runway with a standard Tramrail underslung type crane of 28 ft. span, and a track system of Tramrail showing operation of a number of types of Tramrail carriers, including a push-button pouring device, a turntable pouring device operated and controlled from the operator's cab; a rack carrier for use in conveying flasks about the foundry.

**Cleveland Flux Co., Cleveland. Booth Nos. 418, 419.**

**Cleveland Pneumatic Tool Co., Cleveland. Booth Nos. 432, 434.**

**Clipper Belt Lacer Co., Grand Rapids, Mich. Booth No. 420.**
Clipper belt lacers, fasteners, cutters, with safety feature connecting pins; also the new Clipper speed lacer which will lace both ends of an 8-in. belt in 1½ min. Representative attending: Carl P. Field.

*B. H. Johnson*
Cresson-Morris Co., Philadelphia. Chairman, Plant Visitation Committee

*T. H. Addie*
American Manganese Bronze Co., Philadelphia. Chairman, Golf Committee

*Harry J. Winters*
J. S. McCormick Co., Philadelphia. Member, Plant Visitation Committee

*J. D. Miller*
Cresson-Morris Co., Philadelphia. Member, Plant Visitation Committee

*J. B. Greenstreet*
Olney Foundry Co., Philadelphia. Member, Plant Visitation Committee

*Charles M. Holcomb*
Foundry Equipment Co., Philadelphia. Member, Plant Visitation Committee

**Thomas E. Coale Lumber Co., Elizabeth, N. J. Booth No. 488.**

**Combined Supply & Equipment Co., Buffalo. Booth No. 265.**
Angle Stem and Double Angle chaplets. Representatives attending: Stephen LeViness, Jr., E. E. LeViness.

**Corn Products Refining Co., New York. Booth No. 260.**
Corebinders, Kordek and Mogul. Representatives attending: S. B. Krantz, R. H. DeWaters, H. A. Crown, F. G. Faller, Jr., A. H. Kreischer, P. J. Dapkus, William T. Maguire, J. M. Millikan, H. C. Knubbe.

D

**Dayton Oil Co., Dayton, Ohio. Booth No. 229.**
Core oils and cores of all kinds. Representatives attending: D. S. Hopping, Geo. A. Storer.

**Debevoise-Anderson Co., New York. Booth No. 233.**
Pig iron, coke, nichrome, etc. Representatives attending: Nils Anderson, president; Paul Brooks, vice-president; A. Rhodes, W. K. Callow.

**Decatur Milling Co., Decatur, Ill. Booth No. 209.**

**Deister Concentrator Co., Fort Wayne, Ind. Booth No. 116.**
Mobile type Leahy foundry screen for preparation of sand on the foundry floor. Representatives attending: Don A. Weber, general manager; N. A. Rhune, chief engineer.

**William Demmler & Brothers, Kewanee, Ill. Booth Nos. 458 to 462.**

**Detroit Electric Furnace Co., Detroit. Booth Nos. 451, 453.**
A type LFA, 350-lb. Detroit electric furnace in operation; also a display of castings and products of Detroit electric furnaces in the brass, bronze and gray iron industries. Representatives attending: Edward L. Crosby, president and general manager; A. E. Rhoads, vice-president; L. C. Wilson, L. B. Barker, F. A. Herrmann.

**De Walt Products Co., Leola, Pa. Booth No. 191.**
De Walt "Wonder-Worker" woodworking machines, tools and equipment. Representatives attending: W. Ross Stevens, sales and advertising executive; T. E. Brown and E. L. Duncan of Duncan-Brown Co., Inc., Westville, N. J.

**Diamond Clamp & Flask Co., Richmond, Ind. Booth No. 310.**
Diamond snap flasks, steel jackets, bands, core plates, bottom plates, core boxes, wedges, clamps and flask fittings. Representatives attending: F. J. Gartside, treasurer and president; E. A. Kinley.

**Dietert, Harry W., Detroit. Booth No. 301.**
Foundry sand control machines, consisting of permeability machine, sand rammer, strength machine (Shear bond—complete for green and dry bond of molding sand and cores); moisture indicator, water meters, oven, balance, laboratory Simpson mixer. Representatives attending: H. W. Dietert, Arthur Nearon.

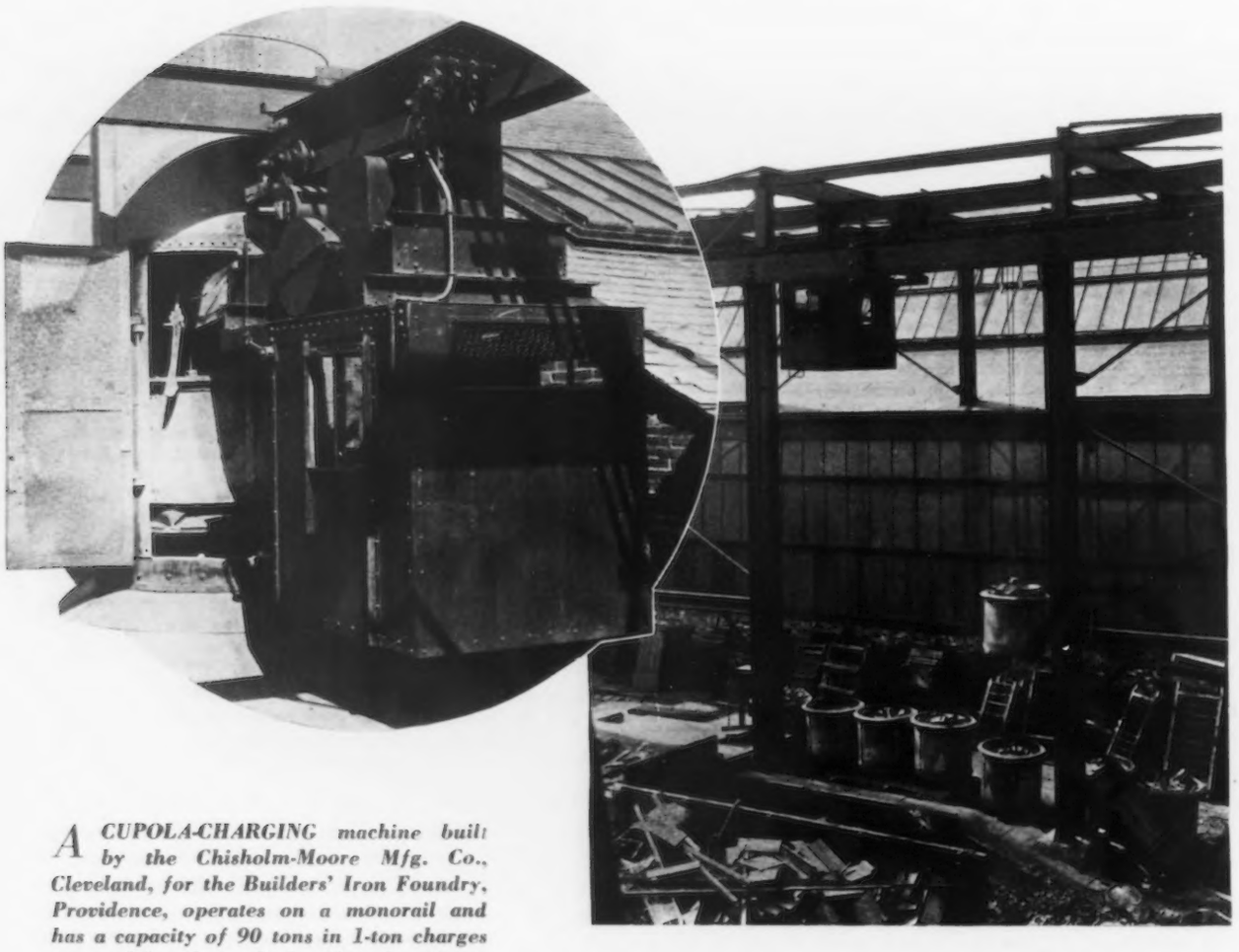
**Joseph Dixon Crucible Co., Jersey City, N. J. Booth No. 270.**

E

**Eastern Clay Products, Inc., Buffalo. Booth No. 284.**
Samples of Revivo bond, a clay binder. Representatives attending: S. H. Cleland, vice-president; C. B. Schureman, G. H. Barnes, R. S. Holland, N. J. Dunbeck, R. L. Cleland.

(*Continued on page 1226*)

## Cupola-Charging Machine Takes Charge from Yard

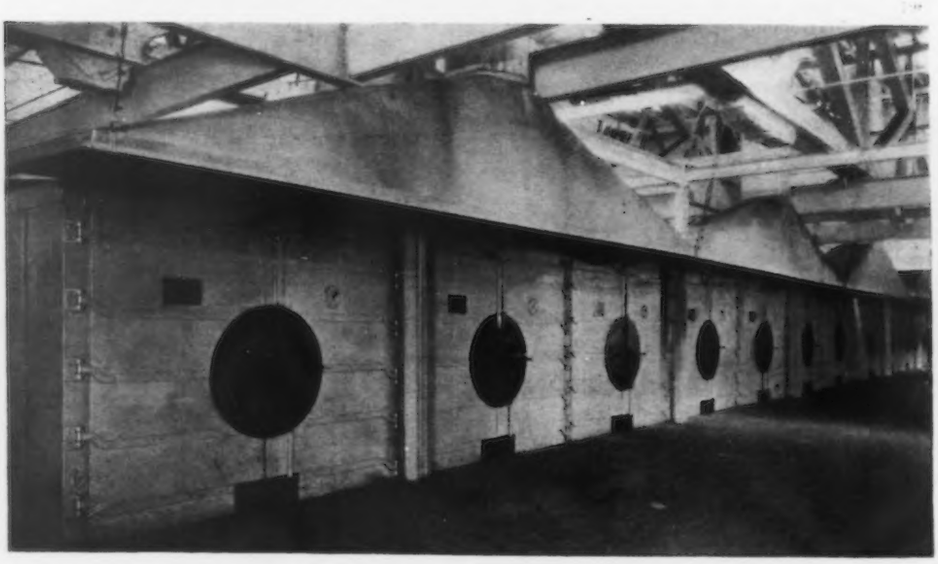


*A CUPOLA-CHARGING machine built by the Chisholm-Moore Mfg. Co., Cleveland, for the Builders' Iron Foundry, Providence, operates on a monorail and has a capacity of 90 tons in 1-ton charges in an 8-hr. day. It handles the charge from the make-up scales on the ground into the cupola. Coke and limestone are handled separately from the pig iron and scrap.*

*One man operates the charger, while two men on the ground make up the charges.*

*The yard picture shows buckets of metal passing across the scale on a gravity conveyor. The charger picks them up at this point and deposits the material on the center line of the cupola, as shown in the other illustration.*

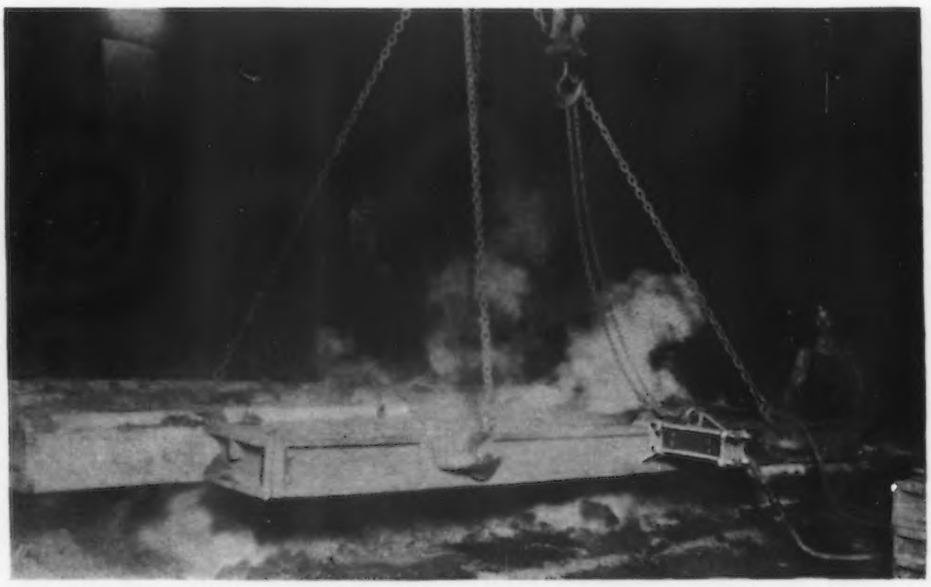
## Extensive Core Baking Installation



*A ROW of 11 rack-type core ovens was installed in the plant of the American Radiator Co., Gloucester, N. J., by the Swartwout Co., Cleveland. The door of each oven carries a clock face for designating the time for removing cores. Oil fuel is used, the firing aisle being at the rear, where valves and control apparatus are accessible. The doors of the ovens have five hinges each*

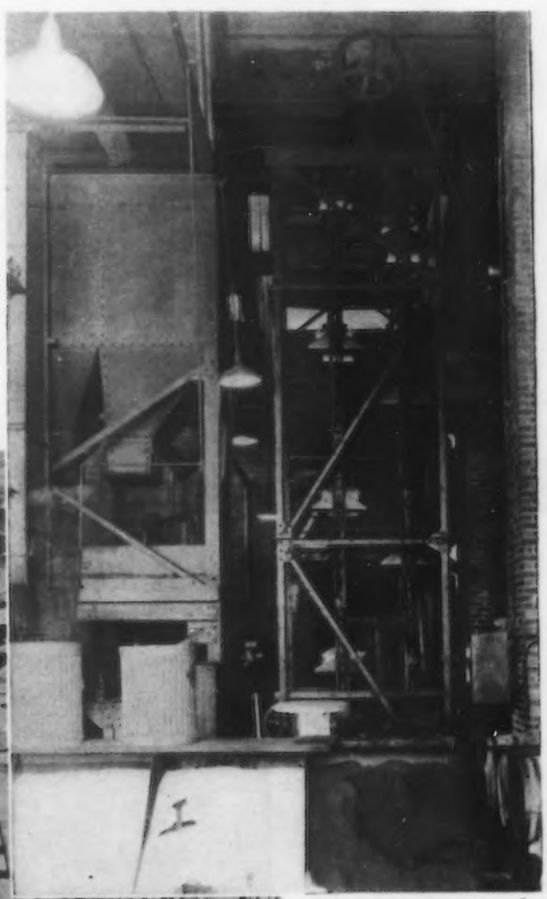
## Flask Rapper Shakes Out Cope in Seven Minutes

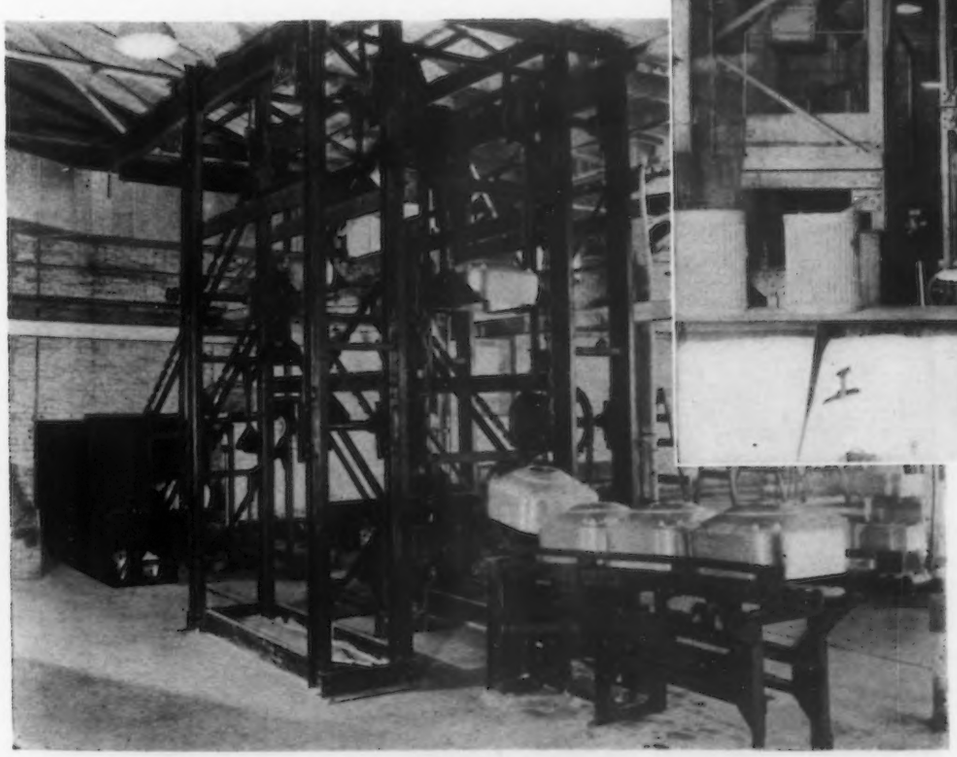
*A 5-in. Branford flask rapper which has been installed by the Malleable Iron Fittings Co., Branford, Conn., in the plant of the Farrel Foundry & Machine Co., Ansonia, Conn., shakes out a cope 10-ft., 6in. x 20-ft., 12 in. in 7 min.—an operation that formerly took six men ½ hr. This cope, with 18-in. gaggers and 12-in. wood soldiers, was rammed with green sand by pneumatic sand rammers.*



## Automatic Transfer of Castings to Machine Shop

*THE loading station and the delivery end of an automatic conveyor equipment for the Maytag Co., Newton, Iowa, was designed by H. M. Lane Co., Detroit, and built by R. W. McIlvaine Co., Chicago. The aluminum foundry is separated from the machine shop and assembly by the iron foundry. A tunnel was constructed under the iron foundry, and the conveyor equipment shown was installed for carrying the thin aluminum tubs, or boxes of aluminum castings, from the short roller conveyor in the aluminum finishing department, down through the tunnel, and then up to a gravity carrier line delivering to the machine shop.*

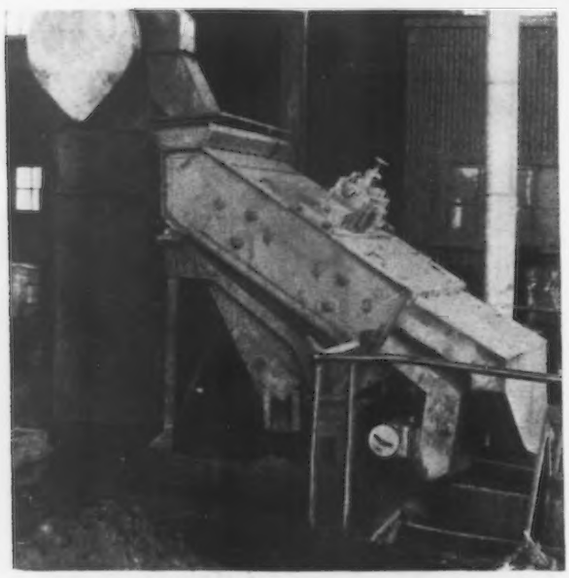




*Above, the delivery end, and, at left, the loading end.*

## Conveying Equipment Eliminates Third Man at Harvester Plant

*THE labor of one man was saved at the plant of the Western Harvester Co., Stockton, Cal., by equipment consisting of a Louden 36-ft., 10-in. transfer crane of 2000-lb. capacity equipped with trolley and 1-ton Shepard electric hoist and 50 ft. of Reelite. The crane is pushed by one man, who also handles the flasks. A second man "sands and fills."*



## Sand Screening Outfit

*INSTALLED by the W. S. Tyler Co., Cleveland, in the plant of the Crucible Steel Castings Co., Cleveland, is a small bucket elevator and the Tyler company's Hum-mer screen, used for the preparation of foundry sand. Sand is fed by hand shoveling into a hopper of the elevator placed level with the floor line. A 2-in. grating prevents large pieces of scrap or lumps from entering. Right and left hand discharge spouts deliver the reclaimed sand and oversize into different buckets and a special hopper placed underneath the apparatus collects the fines. The reclaimed sand is taken by an overhead crane to a Simpson mixer for the final preparation. The unit handles 5 tons of sand hourly.*

## Motive-Type Sandslinger on Jobbing Type of Work

*A MOTIVE type Sandslinger in the plant of the Bartlett-Hayward Co., Baltimore, is used in the making of pipes and fittings. The work comes under the jobbing classification. On two typical jobs there were savings of $6.09 per hour on a simple job and $4.65 per hour under unfavorable conditions.*

## Continuous Automatic Sandblast Tanks for Uninterrupted Production

*IN its new department for the manufacture of electric refrigerators, the General Electric Co., Schenectady, N. Y., has installed a battery of six continuous sandblast tanks. Five supply abrasive to five Slyblast turntable rooms and one to a positive pressure rotary table. The continuous tank does away with the waiting for a sandblast tank to refill as when one or two tanks are used. The equipment was furnished by the W. W. Sly Mfg. Co., Cleveland.*

## Stand Grinders in Malleable Foundry

*THE large battery of stand grinders shown in the accompanying illustration is in the foundry of the Benton Harbor Malleable Industries, Benton Harbor, Mich. The machines were furnished by the Marschke Mfg. Co., Indianapolis, the grinder division of the Black & Decker Mfg. Co.*

## Sand Thrower Conditions and Returns Sand in One Operation

*THE Axmann sand thrower is shown in operation at the plant of the McMyler-Interstate Co., Cleveland. One man now shovels the sand into the sand thrower, which conditions it and returns it to the molding station in one operation. The machine is made by the Axmann Sand-Throwing Machine Co., Cleveland.*

**Eastern Steel Castings, Newark, N. J. Booth Nos. 365, 367.**
Various sizes of a precision type of sandproof, ball-bearing, roller conveyor for green sand mold transportation, and other foundry uses; also a variety of electric steel castings of intricate design, including a new proprietary product, a cast steel automotive wheel, made in green sand entirely without cores. Representatives attending: W. D. Sargent, president; E. F. Miltenberger, vice-president; H. S. Otto, F. D. Campbell, A. L. Bussman, M. C. Renshaw, M. R. Wolfe, C. Rampolla, G. Nelson, F. Paffrath, W. Cadwallader, O. D. Fedderman, S. McClure, F. Sieder.

**D. A. Ebinger Sanitary Mfg. Co., Columbus, Ohio. Booth No. 122.**
Sanitary toilet and wash room. Representative attending: Mr. Evans.

**Edison Storage Battery Co., Orange, N. J. Booth Nos. 9, 10.**
Edison steel-alkaline storage batteries. Representatives attending: G. E. Stringfellow, J. F. Coakley, J. K. Mahaffey, L. R. Lindsley, W. M. Taylor.

**Electric Storage Battery Co., Philadelphia. Booth No. 421.**
Exide Ironclad batteries for propelling electric industrial trucks and tractors. Representatives attending: William Van C. Brandt, W. C. Hooven, J. L. MacBurney, W. W. MacCallum, E. C. Kline.

**Electro Refractories Corporation, Buffalo. Booth No. 228.**
Tercod crucibles, Buffalo patch cement, Kellogg refractories. Representatives attending: L. U. Milward, president; C. A. Asher, Grant S. Diamond, Tom W. Campbell.

**Elwell-Parker Electric Co., Cleveland. Booth No. 448.**
Tructors (lift or self-loading type); tiering and self-unloading type; oven charger; heavy-duty crane. Representatives attending: F. B. Neely, W. G. O'Brien, R. F. Crawford.

F

**Fanner Mfg. Co., Cleveland. Booth No. 253.**
Foundry chaplets and hard tumbling stars. Representatives attending: J. R. Raible, president; C. G. Raible, vice-president; C. E. Ireland, P. D. McDonnell, E. Durant, S. H. Gibson, F. W. Beck.

**Federal Foundry Supply Co., Cleveland. Booth Nos. 359, 361.**
Sand testing equipment for the laboratory, such as bond strength determining apparatus; permeability determining apparatus equipment for making screen analysis. Representatives attending: Ralph Ditty, president; L. H. Heyl, general manager; T. H. Terry, O. E. Peterson, Walter Gerlinger, Geo. H. Donoghue, Elmer Ditty, Geo. A. Fuller, T. J. Brown.

**Fisher Governor Co., Marshalltown, Iowa. Booth No. 438.**
Reducing valves and pressure regulators, steam governors, etc., featuring Fisher type 78 combination air regulator for controlling air pressures in connection with sand blast operation.

**Foundry Equipment Co., Cleveland. Booth Nos. 75, 76.**
Coleman rolling drawer core oven, Coleman portable rack-type core oven, Coleman continuous core oven, etc. Representatives attending: C. A. Barnett, general manager; H. W. Steindorf, M. A. Beltaire, Jr., E. J. Welter, C. M. Holcomb.

**Foundry Manganese Co., Philadelphia. Booth No. 155.**

**Fowler & Union Horsenail Co., Buffalo. Booth No. 224.**
Moldochil nail. Representative attending: Charles A. Reamer.

**General Electric Co., Schenectady, N. Y. Booth Nos. 375, 377, 379, 381.**
Welding equipment, motors and control, and a foundry cupola blowing equipment. T. H. Reeves in charge.

*Minor T. Dean*
**Keystone Coal & Coke Co., Philadelphia. Member, Reception Committee**

*John M. Robb, Jr.*
**Park & Williams, Inc., Philadelphia. Member, Reception Committee**

*W. G. Summers*
**Phoenix Iron Co., Philadelphia. Treasurer, Finance Committee**

*J. A. Davies*
**Westinghouse Electric & Mfg. Co., Philadelphia. Chairman, Hotel Committee**

*J. A. Martin*
**Westinghouse Electric & Mfg. Co., Philadelphia. Member, Hotel Committee**

*Frederick M. Devlin*
**Philadelphia Hardware & Malleable Iron Works, Philadelphia. Chairman, Entertainment Committee**

G

**Girard Smelting & Refining Co., Philadelphia. Booth No. 261.**
Brass and bronze ingots, brass and bronze castings, pig and cake lead, babbitt and solder metal. Representatives attending: Louis Schwab, Albert Katz, George Sall.

**Globe Steel Abrasive Co., Mansfield, Ohio. Booth No. 45.**
Globe cornered steel grit and Globe H. C. chilled shot. Representative attending: C. H. McConnell, manager.

**Great Lakes Foundry Sand Co., Detroit. Booth No. 277.**
Molding, core, and sand blast sands, fire clays, mill stars, coke, limestone. Representatives attending: William J. Muhlitner, vice-president and general manager; John D. Cronenweth, president; James G. Mendenhall, secretary; Neil I. McArthur, H. P. Mackinnon, P. E. Giberson, John E. Lambrix.

**Great Western Mfg. Co., Leavenworth, Kan. Booth No. 114.**
Type HL Combs gyratory laboratory sifter; type V Combs gyratory foundry riddle; new type V-5 Combs gyratory foundry riddle. Representative attending: Charles F. Murphy.

**Grindle Fuel Equipment Co., Harvey, Ill. Booth Nos. 319, 372.**
No. 30 Grindle multi-stage unit pulverizer; No. 3 impact pulverizer with air separation for firing malleable iron annealing ovens; No. 1 pulverized coal burner. Representatives attending: W. R. Bean, D. J. Reese, J. E. Charles, C. R. Taylor, M. F. Becker.

H

**Hayward Co., New York. Booth Nos. 47, 49.**
Hayward electric motor clam shell bucket, air-operated clam shell bucket, automatic take-up reel, air-operated orange peel bucket. Representatives attending: H. S. Atkinson, H. C. Ryder, C. S. Sargent.

**Herman Pneumatic Machine Co., Pittsburgh. Booth Nos. 338, 340, 342.**
Rapid production type 1000-lb. capacity jarr independent rollover and pattern drawing machines. Representatives attending: Thomas Kaveny, president; Thomas Kaveny, Jr.; A. G. Doyle, vice-president; R. F. Ringle, I. J. Oesterling, R. Harris, C. W. Miller, R. P. Morgan, C. S. McMath, W. W. Hughes, Robert M. Porteous, L. L. Johnston, Joseph Gibson, Clarence Short, T. A. Renkenberger, Alfred Herman.

**Hill & Griffith Co., Cincinnati. Booth No. 222.**
Representatives attending: John Hill, Bruce Hill, F. W. Weissmann, William Oberhelman, C. L. Gysin, Matt Geier.

**Holley Permanent Mold Machine, Inc., Detroit. Booth Nos. 461, 463.**
Permanent molding of gray iron castings. Representative attending: H. P. Kimber.

**Hynson, Westcott & Dunning, Baltimore. Booth No. 286, 288.**
Mercurochrome. Representatives attending: W. Rodney Burton, Nathaniel Nicolai, L. C. Shepherd.

I

**Illinois Clay Products Co., Joliet, Ill. Booth No. 221.**
Fire clay, fire clay flour, castings from rebonded sand, etc. Representatives attending: O. L. Jones, president; A. S. Nichols, sales manager; Howard Blackwell, Lee Everett.

**Illinois Testing Laboratories, Inc., Chicago. Booth No. 263.**

**Independent Pneumatic Tool Co., Chicago. Booth No. 464.**
Chipping and riveting hammers, air hoists, grinders, sand rammers, electric nut and screw drivers and tappers

*Ralph Belleville*
Joseph Dixon Crucible Co., Philadelphia.
Chairman, Ladies' Entertainment Committee

*Earl S. Sparks*
Metal Manufacturers Association of Philadelphia.
Chairman, Publicity Committee

*John Morris Combs*
Combs Advertising Agency, Philadelphia.
Member, Publicity Committee

and moisture separators; also new rotary grinders and sanders. Representatives attending: R. T. Scott, vice-president; A. Anderson, A. L. Schuhl, H. F. White, H. F. Charbono, W. E. Doughtery, H. F. Nivison, J. A. Hill.

**Indiana Consumers Gas & By-Products Co., Terre Haute, Ind., and Chicago. Booth Nos. 230, 232.**
Foundry coke. Representatives attending: Leon Stern, general manager of sales; Lewis D. McClaren, Lloyd E. Davis, John Molony.

**Industrial Minerals Co., Columbus, Ohio. Booth Nos. 244, 246.**
Foundry sands and castings. Representatives attending: W. G. Edwards, Ed. R. Williams, H. N. Rose.

**Ingersoll-Rand Co., New York. Booth Nos. 128, 130, 132, 134.**
Pneumatic tools and electric-driven air compressor, air motor hoists, sand rammers (floor and bench types), core breakers, chipping hammers, portable grinders, drills, riveters, safety-first air saws, pneumatic tool accessories.

**International Molding Machine Co., Chicago. Booth Nos. 347, 349, 351, 353, 400, 402, 404, 406.**
Jolt squeezers, post jolt squeezers, jolt squeeze strip machines, jolt hand stripping machines, jolt power stripping machines, jolt power lifting machines, plain stripping machines, jolt ramming power turnover power draw machines, jolt ramming power turnover foot draw machines, jolt ramming hand turnover foot draw machines, core turnover draw machines. Representatives attending: Edward A. Pridmore, president; Harold E. Pridmore, Lawrence D. Pridmore, W. W. Miller, Carl Levahn, E. G. Borgnis, Hugh Gallagher, M. J. Monahan, W. J. Rowley, Luke S. Shannon, W. J. Briggs.

**International Nickel Co., New York. Booth No. 416.**
Typical industrial applications of nickel cast iron and other nickel alloys. Representatives attending: F. S. Jordan, R. A. Wheeler, E. J. Bothwell, A. J. Wadhams, T. H. Wickenden, J. S. Vanick, F. B. Coyle, D. M. Houston, T. J. Wood.

J

**Jeffrey Mfg. Co., Columbus, Ohio. Booth No. 357.**
Conveying equipment.

**Johnston & Jennings Co., Cleveland. Booth Nos. 440, 442, 444.**
New type jolt rollover draw machine with air clamp and equalizer; new design jolt squeeze machine; also jolt squeeze pattern draw machine, and portable type jolt squeeze machine. Representatives attending: T. J. Calhoun, vice-president; J. L. Battenfeld, R. W. Gramling.

K

**Charles C. Kawin Co., Chicago. Booth No. 212.**

**Keller Mechanical Engineering Corporation, Brooklyn. Booth No. 165.**
Keller BK flexible shaft grinders and the KELLocatER. Representatives attending: Paul C. Renno, Henry Schreiber.

**Spencer Kellogg & Sons, Inc., Buffalo. Booth Nos. 145, 200.**
Core oils, cores made of same, finished castings. Representatives attending: W. L. Goetz, V. A. Acer, E. G. Allen, E. J. Felt, D. J. Healy, E. A. Medbery, H. J. Strassberger, J. N. Yaeger.

**Keystone Coal & Coke Co., Greensburg, Pa. Booth No. 238.**
Keystone selected foundry coke. Representatives attending: F. B. Miller, W. F. Elwood, S. J. Stump, M. T. Dean, J. M. O'Brien, R. E. Diehl, F. H. Pharaoh, H. Geisel, Jr.

**Keystone Lubricating Co., Philadelphia. Booth Nos. 151, 153.**
Foundry equipment fitted with the Keystone safety lubricating system; new Keystone pneumatic safety lubricator; various Keystone lubricants. Representatives attending: H. A. Buzby, president; G. W. Hall, T. B. Little, J. R. Lawrence, C. T. Moyer, F. D. Street.

**Kling Bros. Engineering Works, Chicago. Booth No. 68.**
New high-speed double-end heavy duty grinder. Representatives attending: P. E. Kling, H. J. Aagaard.

**Knefler-Bates Mfg. Co., Indianapolis. Booth No. 290.**
K-B core binder. Representatives attending: Ernest Knefler, president; Geo. B. Hill, sales manager; Herbert J. Bever, John A. Green.

**H. W. Knight & Son, Seneca Falls, N. Y. Booth No. 3.**
White metal and brass pattern letters and figures and foundry trademarks. Representative attending: H. D. Knight.

**Kramer & Co., H., Chicago. Booth No. 274.**
Ingot brass and bronze, brass and bronze castings. Representatives attending: I. Kaden, vice-president; L. Chapman, sales manager; William Romanóff, S. M. Marks, George H. Grone.

L

**William Laidlaw, Inc., Belmont, N. Y. Booth No. 428.**

**Lancaster Coal & Sand Co., Lancaster, Ohio. Booth No. 223.**
Indian red molding sand and Flex-Spar bond. Representatives attending: T. E. Hummell, president; D. L. Hansberger, secretary and treasurer; E. L. Smitherman.

**H. M. Lane Co., Detroit. Booth No. 208.**
Drawings and photographs of foundries and equipment. Representatives attending: H. M. Lane and G. Pitt.

**Lava Crucible Co. of Pittsburgh, Pittsburgh. Booth No. 280.**

**Leeds & Northrup Co., Philadelphia. Booth No. 417.**
L & N potentiometer pyrometers for automatic control, for automatic recording and control, for automatic recording only and for indicating temperatures. These are the powerful, motor-driven type of pyrometers operating on the potentiometer principle or on the resistance principle. Also optical and portable instruments. Representatives attending: Henry Brewer, E. B. Estabrook, Oscar Brewer, E. C. Wood.

**Lehigh Safety Shoe Co., Allentown, Pa. Booth No. 5.**
Safety shoes for every department of industry. Representatives attending: Charles Clauser, John Clauser.

**Linde Air Products Co., New York. Booth Nos. 281, 283.**
A complete line of Oxweld acetylene welding and cutting equipment, showing by actual examples the application of the acetylene process in the foundry industry. Representatives attending: E. B. Farwell, W. E. Mittenmeyer, R. W. Boggs.

**Lindsay McMillan Co., Milwaukee. Booth No. 307.**
Rosinal and its various uses in foundry practice; also an interesting display of the different items used in the manufacture of Rosinal. Representatives attending: W. R. Pate, vice-president; J. A. Gitzen, M. A. Pollard, A. E. Welch.

**Link-Belt Co., Chicago. Booth Nos. 90, 92.**
An operating mold conveyor, speed reducers, belt conveyor idlers, vibrating shakeout riddle, elevating machinery and drive chain; also photographs of Link-Belt foundry installations. Representatives attending: E. L. Berry, W. C. Carter, J. J. Hartley, R. J. Heisserman, A. H. Moore, G. L. Morehead, George O'Connor, Norman Smith, H. L. Strube, M. Tholen.

(*Continued on page* 1232)

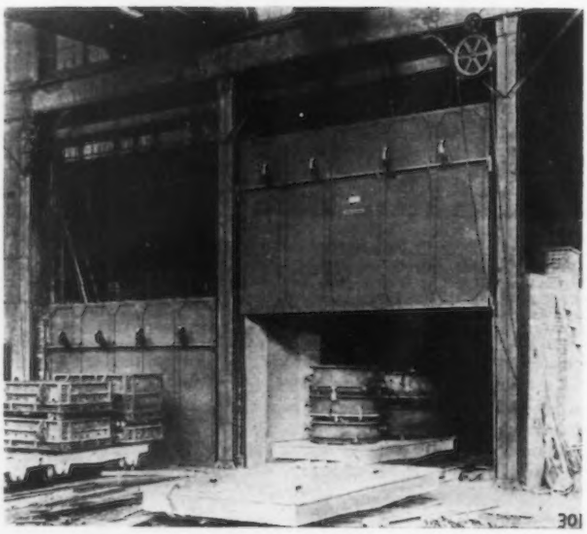
*Walter L. Kalbach*
Philadelphia.
Chairman, Transportation Committee

*A. P. Lee*
William Sellers & Co., Philadelphia.
Member, Transportation Committee

*H. L. Hennsey*
Carborundum Co., Philadelphia.
Member, Transportation Committee

## Reduce Mold Drying Time Nearly 50 Per Cent

*TWO large Coleman mold drying ovens, which have been installed in one of the plants of the Worthington Pump & Machinery Corporation by the Foundry Equipment Co., Cleveland, have reduced drying time nearly 50 per cent, it is claimed, with a corresponding saving in fuel. The ovens are 16 ft. wide, 30 ft. long and 10 ft. high. Molds, it is emphasized, require no patching or secondary heating.*



## Grinder Maintains Surface Speed as Diameter Is Reduced

*A MULTI-SPEED grinder, which is one of an installation by the United States Electrical Tool Co., Cincinnati, at the plant of the Peerless Foundry Co., Cincinnati, can be adjusted to maintain a high surface speed as the diameter of the wheel is reduced. The original wheel is 24 x 4 x 2¼ in. and the speed at this size and down to 19 in. is 900 r.p.m., no load, with a periphery maximum of 5700 ft. per min. and a minimum of 4500 ft. At this point the speed is changed to 1200 r.p.m. by adjusting the wheel guard to gain accessibility to the wheel and the maximum is then 6600 ft. per min. The wheel is carried at this speed down to 14-in. diameter when another adjustment is made and thence down to 10-in. diameter at which point the wheel has approximately 4700 ft. speed. Thus a surface speed above 4500 ft. per min. is maintained from a 24-in. to a 10-in. diameter without changing. The guards are arranged to prevent running a large wheel at an unsafe speed.*

## Vibratory Screen Handles 90 Tons of Sand Per Hour

*ONE of the large foundries in Detroit has installed equipment which handles foundry sand at the rate of 90 tons per hr. The equipment includes a Leahy No-blind vibrating screen, 3 x 6 ft., motor driven, manufactured by the Deister Concentrator Co., Fort Wayne, Ind. The sand drops from a belt conveyor to the vibrating screen, which has clear openings of ⅝ in., the finer sand dropping into a hopper below and through a hole in the bottom to the floor, while the coarser particles are directed to the left as indicated.*

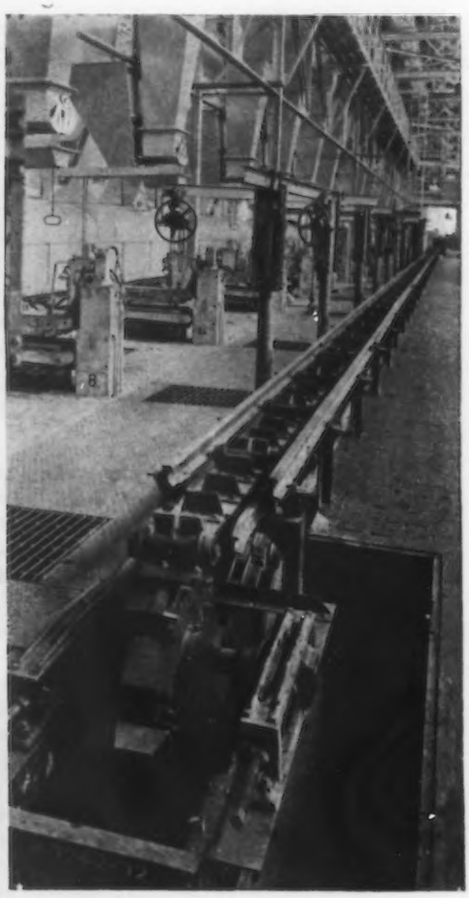
# Molding Units in the Buick Foundry

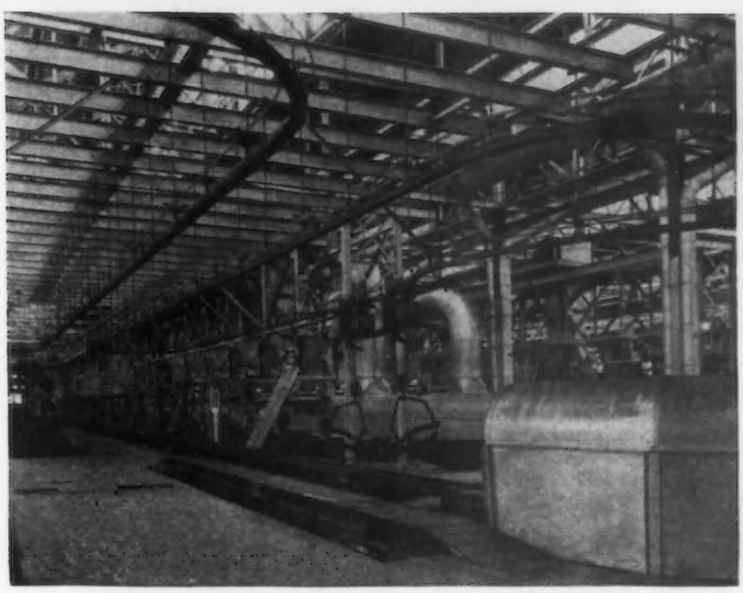
SIX molding units designed, built and installed by the C. O. Bartlett & Snow Co., Cleveland, are included in the Buick foundry at Flint, Mich. General description of the foundry and its component parts was given at pages 643 of THE IRON AGE of Sept. 8, 1927; 1217 of Nov. 3; 1363 and 1372 of Nov. 17; 1582 of Dec. 8, and 1784 of Dec. 29.

Some of the features not covered specifically in the descriptions previously printed are shown in the three photographs on this page. The upper left picture gives a general view of part of one of the molding units, including the mold conveyor, facing and molding sand hoppers, return conveyor for flasks, overhead belt conveyor for sand and, in the background, the hooded mold cooling conveyor depended upon to keep the foundry measurably free from fumes and heat.

The picture at the right shows the sprocket wheel drive and conveyor construction of the molding conveyor running alongside the molding machines. This is a detail of the general view. Into the gratings in the steel plate floor alongside the conveyor is disposed the sand spilled in handling, to keep the floor clean.

The picture at the lower left shows the pouring end of a molding unit. In the foreground is a moving walkway from which metal is poured into the molds just before they enter the hooded cooling conveyor. The conveyor makes a complete 180-deg. turn at this point, that portion showing in the background being an extension of the portion in the right foreground. Two of the ladle carriers appear above the pouring platform.





**MOLDING UNITS OF THE BUICK FOUNDRY AT FLINT, MICH.**

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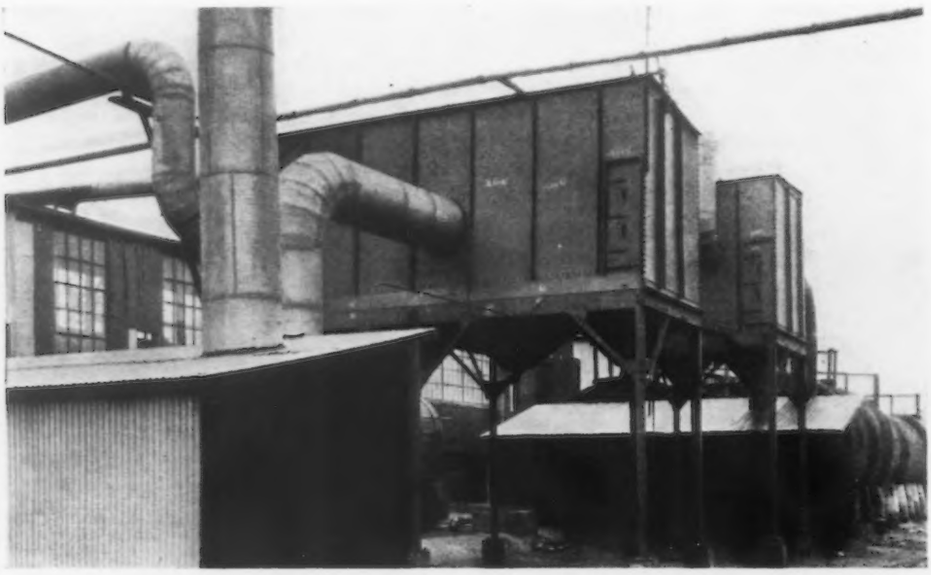
Publication No. 204 in a series of translations of industrial standard specifications contains the English text and a Portuguese translation of the standard specifications for the manufacture of open-hearth steel girder rails, A.S.T.M. standard A2-27. This series is issued by the United States Department of Commerce, and the publication cited may be obtained from the Superintendent of Documents, Washington, D. C., for 5c.

## Filter Equipment for Dust from Grinders and Tumblers



*THE Glancy Malleable Corporation, Waukesha, Wis., recently installed dust filter equipment, which was built by the Whiting Corporation, Harvey, Ill. The equipment consists of one 17-ft. filter with a 5-ft. settling chamber, providing exhaust for grinders, and one 8-ft. filter for exhausting the tumbling barrels.*

## Slide-Rail Conveyor for Handling Molds

*MOLDS are carried along the slide rails by means of dogs. The driving mechanism is a heavy Falk speed reducer with 6-in. low-speed shaft. Variable speeds from 2½ to 7½ ft. a min. may be obtained.*

*Designed especially for handling heavy molds, the slide-rail conveyor is of massive construction. It is mounted on a steel base made of 9-in. channels set flush with the floor. On these are fastened the cast steel brackets carrying the rails. These rails are 50 lb. a yard on the load side and 20 lb. a yard on the return side. The equipment was installed by the Jeffrey Mfg. Co., Columbus, Ohio. Each attachment or pusher link of the chain has a 4-wheel truck, these being spaced on 6-ft. centers. The trucks are not lubricated, but heavy oil is placed on the slide rails.*

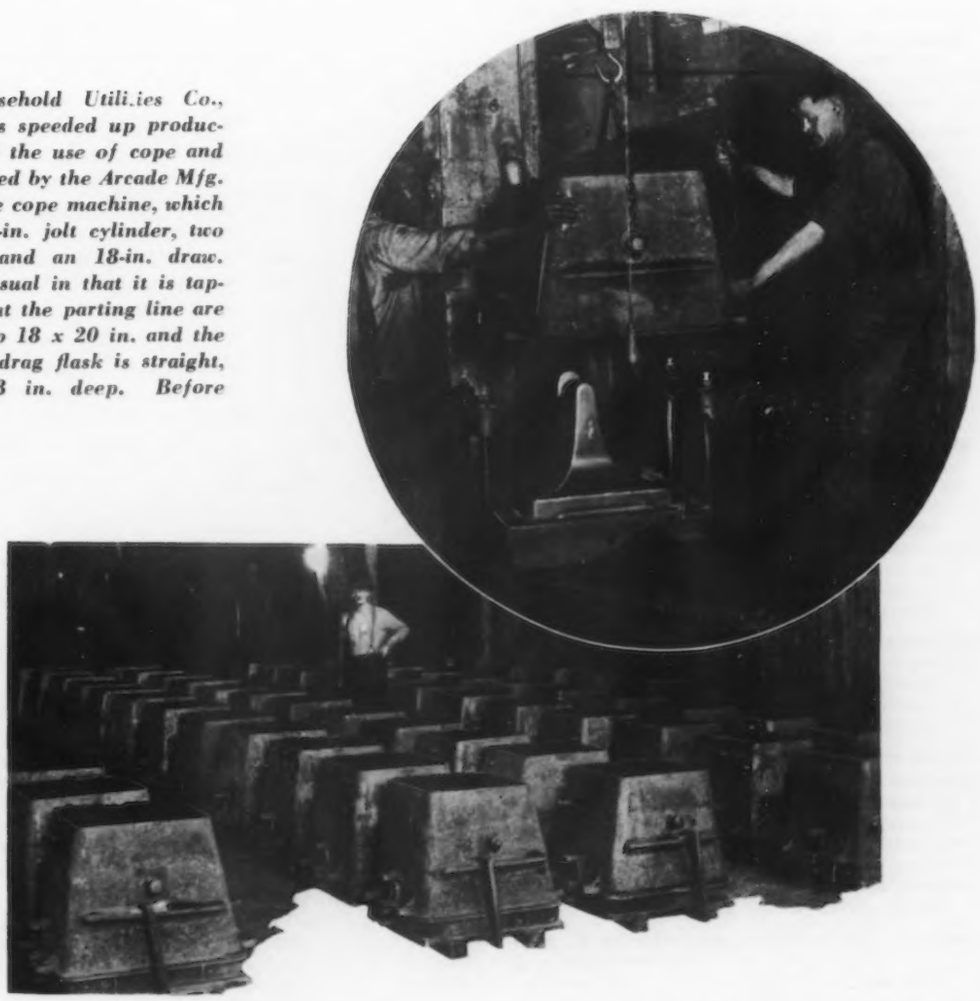
## Sand Digger for Transferring Sand to Molding Floor

*THE Clarktor sand digger as used at the plant of the Lakey Foundry & Machine Co., Muskegon, Mich., to transfer sand from the sand storage bins to the molding floor. The machine, which is manufactured by the Clark Tructractor Co., Battle Creek, Mich., is shown with the scoop driven into the sand pile.*

## Monorail Track for Serving Mold Turntables

*AT the Metric Metal Works, Erie, Pa., a Louden monorail track serves the mold turntables. The metal is poured into molds directly from a ladle on the track. A second parallel track was installed for the return of ladles to the furnaces.*

## Cope Molding Machine with Tapered Cope Flask



*THE Electric Household Utilities Co., Waukegan, Ill., has speeded up production in its foundry by the use of cope and drag machines furnished by the Arcade Mfg. Co., Freeport, Ill. The cope machine, which is illustrated, has a 7-in. jolt cylinder, two 5-in. strip cylinders and an 18-in. draw. The cope flask is unusual in that it is tapered; the dimensions at the parting line are 22 x 25 in., at the top 18 x 20 in. and the depth is 21 in. The drag flask is straight, 22 x 25 in., and 3 in. deep. Before installing these machines the company's production of an ironer base casting was 12 per day for two men, or a total of 96 per day for the 16 men employed at this work; the new equipment, it is stated, has shown a maximum production of 110 castings in one day with five men working.*

*M. R. Taggart*
**Paxson-Taggart, Inc., Philadelphia. Member, Plant Visitation Committee**

*R. T. Covington*
**Bartlett-Hayward Co., Baltimore. Member, Plant Visitation Committee**

*J. A. Strecker*
**Cochrane Corporation, Philadelphia. Member, Plant Visitation Committee**

**Louden Machinery Co., Fairfield, Iowa. Booth Nos. 148 to 154.**
Double bead and super-track monorail systems; electric hoists; electric ladle pouring device; transfer cranes. Representatives attending: R. B. Louden, president; R. Bruce Louden, secretary; Roy Louden, advertising manager; L. F. Berthold, sales manager; P. M. Hassler, H. L. Stetser, P. L. McCain, E. H. Seelbach, W. H. Eldridge, Philip Kinzel.

**Lowe Mfg. Co., Detroit. Booth No. 436.**
Electric sifting machines. Representative attending: R. G. Lowe.

**Lupton's Sons Co., David, Philadelphia. Booth No. 236.**
Pond continuous windows, Pond operating device, Lupton pivoted windows, Lupton skylights, Pond roof designs tives attending: Clarke P. Pond, George N. Hingston, including Pond truss and Pond A-frames. Representa- J. W. Kauffman.

M

**McCormick Co., J. S., Pittsburgh. Booth Nos. 158, 160, 162.**
Foundry facings, supplies and equipment. Representatives attending: J. S. McCormick, president; H. T. Herr, Jr., vice-president; Frank J. Buerger, secretary; H. D. Fowler, C. C. Bumbaugh, Harry J. Winters, James W. Early.

**R. W. McIlvaine Co., Chicago. Booth No. 237.**

**Macleod Co., Cincinnati. Booth No. 39.**
New type sand blast hose machine, cupola lighter and skin dryer, pressure type sprayer, steel swab, brass swab. Representative attending: James Lauder.

**Maehler Co., Paul, Chicago. Booth Nos. 61, 63.**
Rack type oven in operation with Universal gas heater and temperature control equipment; Universal heaters and blowers and control equipment for core ovens. Representatives attending: A. E. Maehler, R. C. Schwarz, H. R. Fox, H. M. White.

**Malleable Iron Fittings Co., Branford, Conn. Booth Nos. 31, 33.**
Branford flask rapper vibrators, pot rapper vibrators, dual purpose vibrators, long stroke vibrators, regular vibrators, knee valves, hand valves, sprayers and other foundry accessories. Representatives attending: George B. Pickop, Raymond F. Wright, Thorwald F. Hammer, George Agnew, Oscar Montelius, Lincoln Fitzpatrick.

**Manhattan Rubber Mfg. Co., Passaic, N. J. Booth No. 70.**
Grinding wheels and machines. Display in conjunction with that of Kling Brothers Engineering Works of Chicago. Includes Kling heavy-duty grinder stand and Manhattan swing-frame grinders such as are generally used in steel foundries. Manhattan rubber bonded wheels mounted on machines and both in operation to show actual performance. Representatives attending: N. Clif Hilton, W. H. Steinberg, W. F. Bechtel.

**Marschke Mfg. Co., Indianapolis. Booth Nos. 102, 104, 106, 108.**
Complete line of motor driven grinders in stand and swing frame, for both standard vitrified speeds and high-speed bakelite wheels. Representatives attending: W. A. Marschke, Luke M. Boyd, J. A. Fairfield, W. T. Johnston.

**Martin-Rosebury Corporation, New York. Booth No. 82.**

**Mathews Conveyor Co., Ellwood City, Pa. Booth No. 15.**
Mathews heavy duty foundry roller conveyor and pallet conveyors shown handling castings, molds, etc.; also overhead chain-operated trolley conveyor. Representatives attending: F. E. Moore, president; J. H. Hough, sales manager; F. A. Francois, H. F. Davis, O. P. Hicks, E. F. Smith, F. W. Achuff, C. E. Achuff.

**Mathieson Alkali Works, Inc., New York. Booth No. 7.**
Purite (Fused soda ash). Representatives attending: G. S. Evans, R. G. Kendrick, W. D. Marshall, J. R. Schmertz.

**Mercury Mfg. Co., Chicago. Booth Nos. 330, 332.**
Mercury electric industrial tractors, Mercury gasoline industrial tractors, Mercury industrial trailers for foundry use. Representatives attending: Conrad Hibbeler, C. H. Clare, A. L. Wood, Charles Keiper, P. W. Cyphers, L. J. Kline.

**Milwaukee Foundry Equipment Co., Milwaukee. Booth No. 17.**
Moving pictures showing molding equipment in operation in various foundries. Representatives attending: E. J. Byerlein, general manager; H. E. Fellows, L. E. Gregory, C. J. Jurack, J. E. Lambrix, T. J. Magnuson, J. H. Morton, M. F. Byrne.

**Monarch Engineering & Mfg. Co., Baltimore. Booth Nos. 485, 486, 487.**
No. 92 Simplex furnace complete with oscillating device; double chamber furnace No. 1; revolving core oven; Acme core oven, coal, coke, oil or gas fired; 250-lb. iron pot tilting aluminum furnace; No. 60 tilting oil-fired furnace; No. 40 stationary gas-fired furnace on legs; new No. 60 stationary preheated air furnace; 250-lb. capacity tilting reverberatory furnace, etc. Representatives attending: Harry D. Harvey, James V. Martin, William H. Raber, Mack C. Losinski, Wilford Wilkins, Harold L. Harvey, William Chenowith.

**Mt. Jewett Fire Clay Co., Mt. Jewett, Pa. Booth No. 214.**
Blended fire clay for bonding iron foundry and steel foundry molding sands; ground fire clay for general purpose use in foundries; Waldak treated clay, a refractory cement. Representatives attending: Edward M. O'Neill, general manager; A. F. Shaffer, sales manager.

N

**National Engineering Co., Chicago. Booth Nos. 37, 110.**
No. 3, 8-ft. dia. pan, Simpson intensive sand mixer with speed reducer, motor base and couplings, including motor; also No. 0, 3-ft. pan, Simpson mixers with motor and worm gear reducer for demonstrating the blending action of the Simpson mixer. Representatives attending: H. S. Simpson, president; A. G. J. Rapp, Barney Castor, W. A. Kellogg, H. N. Schreuder, W. C. Edgar, C. D. Hollins.

**National Pulverizing Co., Millville, N. J. Booth No. 305.**
Sand blast sand, dry sands, ground silica or mold wash. Representatives attending: Wilbert Bivins, president; A. S. Carman, treasurer; F. M. Wheat.

**National Smelting Co., Cleveland. Booth No. 285.**

**New Haven Sand Blast Co., New Haven, Conn. Booth Nos. 137, 139, 141, 143, 190, 192, 194, 196.**
Barrels, dust arrestor, rooms, tumbling mill, cabinet. Representatives attending: D. S. Sammis, C. E. Billings, G. C. Fatscher, S. S. Parsons, Robert Wisely, L. Thompson.

**New Jersey Silica Sand Co., Millville, N. J. Booth No. 247.**
Molding sands, sand blast sands, silica flour or mold wash, special blended sands. Representatives attending: Burdette Tomlin, president; Clarence R. Wolf, secretary-treasurer; Jack Hallard.

**Niagara Falls Smelting & Refining Corporation, Buffalo. Booth No. 218.**
Special non-ferrous alloys; unusual castings made with Falls Brand alloys. Representatives attending: Ernest G. Jarvis, Raymond Hunter, George B. Michie, Samuel Frankel.

**Nicholls Co., Inc., William H., Brooklyn. Booth Nos. 69, 71, 140, 142.**
Molding machines. Representatives attending: William H. Nicholls, president; Fred W. Dixon, Dominic Petrocelli, G. Anderson, L. R. Schocken.

**Northern Engineering Works, Detroit. Booth Nos. 369, 371.**
Standart-ized crane trolley; Hi-Lift electric hoist. Representatives attending: Henry W. Standart, H. C. Rood, S. E. Schneider.

**Norton Co., Worcester, Mass., Booth Nos. 443 to 449.**
Grinding machines and grinding wheels.

O

**Obermayer Co., S., Chicago. Booth Nos. 38, 40, 42.**
Foundry facing, foundry equipment, refractory and facing gun, molding equipment, etc. Representatives attending: Theodore Kauffmann, president; S. T. Johnston, vice-president; E. D. Frohman, vice-president; J. L. Cummings, F. Flynn, W. R. Cummings, W. C. Samuels.

**Oiless Core Binder Co., Cleveland. Booth No. 272.**
Oiless core binder together with two new products, Oiless core-mold wash and core paste; also a few cores, dry sand molds and difficult castings showing results as actually produced in the foundry. Representatives

attending: J. H. Bruce, president; J. A. Hamilton, vice-president; H. A. Baker, secretary-treasurer; H. B. Fischer, sales manager.

**Oliver Machinery Co., Grand Rapids, Mich. Booth Nos. 129 to 133 and 182 to 186.**

Woodworking machines including: No. 94-D Straitline cut-off saw; No. 94-T metal table for operating with saw; No. 199-D motor arbor single surface planer; No. 34-E disk and spindle sander; No. 116-D motor arbor band saw; No. 51-B motor head speed lathe; No. 25-B motor head pattern makers' lathe; No. 72-D motor arbor vertical single spindle boring machine; No. 88-D tilting motor arbor miter saw; No. 12-AD motor arbor pattern shop jointer; No. 144-D motor arbor 6-in. jointer; No. 585 oilstone tool grinder; No. 462 electric band saw brazer; No. 190-D motor-driven self-contained inside edge and scroll sander; No. 191 7-in. tilting arbor saw bench; No. 192 18-in. direct motor band saw; No. 182 direct motor disk sander; No. 181 motor-driven spindle sander. Representatives attending: A. S. Kurkjian, general sales manager; Arthur Blake, Charles A. Ginter, J. R. Duthie, J. E. McLauchlen, C. R. Crosley.

**Tinius Olsen Testing Machine Co., Philadelphia. Booth No. 197.**

Several transverse testing machines for testing the standard transverse foundry bar, both of indicating and recording type; Herbert pendulum hardness tester with various attachments; motor-driven production type Brinell hardness tester; Olsen-Boyd automatic testing machine for testing foundry cores; Honda sharpness tester, special extensometers and recording instruments. Representatives attending: T. Y. Olsen, R. B. Lewis, Jacob Lundgren, B. D. Lewis.

**Osborn Mfg. Co., Cleveland. Booth Nos. 425 to 439.**

Improvements in sand treating and sand and mold handling equipment; also a squeezer machine making molds continuously. Representatives attending: F. G. Smith, president and general manager; H. R. Atwater, vice-president; E. S. Carman, secretary and chief engineer; M. W. Zeman, E. T. Doddridge, J. C. Alberts, F. T. Spikerman, R. E. Kiefer, H. B. Klar, G. G. Adam, R. C. Miller, R. W. Hisey, P. F. Smith, J. D. Wise, R. F. Lincoln.

**Ottawa Silica Co., Ottawa, Ill. Booth No. 275.**

Flint shot sand and Diamond sand blast sand. Representatives attending: E. O. Schneider, sales manager; Edward H. Stehman, sand blast engineer.

**Albert T. Otto & Son, New York. Booth Nos. 19 to 23.**

P

**Pangborn Corporation, Hagerstown, Md. Booth No. Block E.**

Sand-blast room, barrel and table equipment, dust arresters, and protective clothing; sand-blast abrasives and supplies. Representatives attending: Thomas W. Pangborn, president; John C. Pangborn, vice-president; H. D. Gates, sales manager; W. C. Lytle, J. J. Carr, C. T. Bird, L. W. Wagner, Wm. T. Randall, Fred E. Wolf, Jesse J. Bowen, E. C. Gilmour, George A. Cooley, B. R. Artz, Charles A. Boultman, L. L. Stouffer, M. I. Dorfan, P. J. Potter, Foster J. Hull, William A. Rosenberger, E. J. Dunbeck.

**Patent Cereals Co., Geneva, N. Y. Booth No. 303.**

Rex core and facing binder. Representatives attending: A. N. Duncan, T. K. Fahy.

**Paxson-Taggart Co., Philadelphia. Booth No. 293.**

Foundry equipment and supplies.

**Pennsylvania Foundry Supply Co., Philadelphia. Booth No. 300.**

Foundry supplies.

**Pettinos, Charles, New York. Booth No. 252.**

Various kinds of molding sand, core sand, plumbago, various foundry facings, core blacking, dry sand blacking, ingot mold blacking, etc. Representatives attending: Charles Pettinos, W. T. Bennett, J. Howard Bing, Marshall M. Houskeeper, Walter H. Laros, Walter J. Meighan, Martin Meiss.

**Pettinos, George F., Philadelphia. Booth No. 254.**

Foundry sands, foundry facings, foundry supplies. Representatives attending: George F. Pettinos, George A. Doughter, B. M. Bird, James H. Hatten, T. H. Walker, F. H. Goodfellow, Miss A. M. Kunkle, D. S. Yeomans, J. R. Cooney, E. G. Stratton, George F. Pettinos, Jr.

**Pittsburgh Electric Furnace Corporation, Pittsburgh. Booth Nos. 461, 463, 465, 469.**

Small 'Lectromelt furnace pouring iron for castings to be made in Holley Carburetor Co. permanent molds; joint exhibit Pittsburgh Electric Furnace Corporation and Holley Carburetor Co. Representatives attending: W. B. Wallis, president; W. E. Lewis, R. D. Thomas, Alexander Haigh, Presley Hamilton, W. H. Payne, W. L. Kammerer.

*C. E. Schley*
**Pennsylvania Bronze & Brass Co., Philadelphia. Member, Plant Visitation Committee**

*W. B. Coleman*
**W. B. Coleman & Co., Philadelphia. Member, Plant Visitation Committee**

*R. B. Van Norman*
**Cleveland Pneumatic Tool Co., Philadelphia. Member, Plant Visitation Committee**

**Port Crescent Sand & Fuel Co., Detroit. Booth No. 278.**

**Portage Silica Co., Youngstown. Booth No. 306.**

Samples of Portage steel molding, core and sand blast sands; samples of Portage silica conglomerate in its natural state. Representatives attending: E. E. Klooz, C. F. Eberhart, Lee R. Farrell.

**Precision Grinding Wheel Co., Philadelphia. Booth No. 175.**

Grinding wheels.

**Production Equipment Co., Cleveland. Booth Nos. 124, 126.**

Cleveland sandcutters. Representatives attending: L. P. Orr, H. E. Johnson, L. Vergith.

**Pulmosan Safety Equipment Corporation, Brooklyn. Booth No. 296.**

Safety equipment including dust respirators, sand blast hoods, helmets, acid hoods, first-aid equipment, safety shoes, paint spray respirators, goggles, asbestos equipment, gas masks. Representatives attending: Frederick Wahlert, president; William H. Wahlert, secretary.

**Pyrometer Instrument Co., New York. Booth No. 248.**

Optical, insertion and radiation pyrometers. Representative attending: F. Heidorn.

R

**Cyrus Rapoport, New York. Booth No. 424.**

**Reading Chain & Block Corporation, Reading, Pa. Booth No. 59.**

Chain hoists, electric hoists, I-beam trolleys, traveling cranes, mono-rail systems. Representatives attending: F. H. Howard, Fred A. Howard, Philip K. Howard, Lloyd W. Lutz, E. I. Huff, H. A. White.

**Charles Reines, Brooklyn. Booth No. 287.**

**Robeson Process Co., New York. Booth No. 215.**

Glutrin and Goulac core sand binders. Representatives attending: Gordon I. Lindsay, president; B. W. Bullen, secretary; T. J. Ryan, T. J. O'Hara, J. A. Smith.

**William C. Robinson & Son Co., Baltimore. Booth No. 314.**

**Rogers Brown & Crocker Bros., Inc., New York. Booth No. 220.**

Pig iron, coke, ferroalloys, molding sand fire clay, etc. Representatives attending: C. H. Newcomb, George R. Sullivan, W. J. Gallana, L. H. Hoskins, L. H. Miller, L. Tierney, C. E. Trommer, J. A. Claussen, C. A. Reed, H. W. Fernald, Thomas A. Wilson, Harwood Wilson, F. W. Bauer, Grant B. McLaughlin, J. R. Morehead.

**Rohrbacher Shoe Co., Boston. Booth No. 295.**

Safety shoes for foundry workers.

**Rotor Air Tool Co., Cleveland. Booth No. 51.**

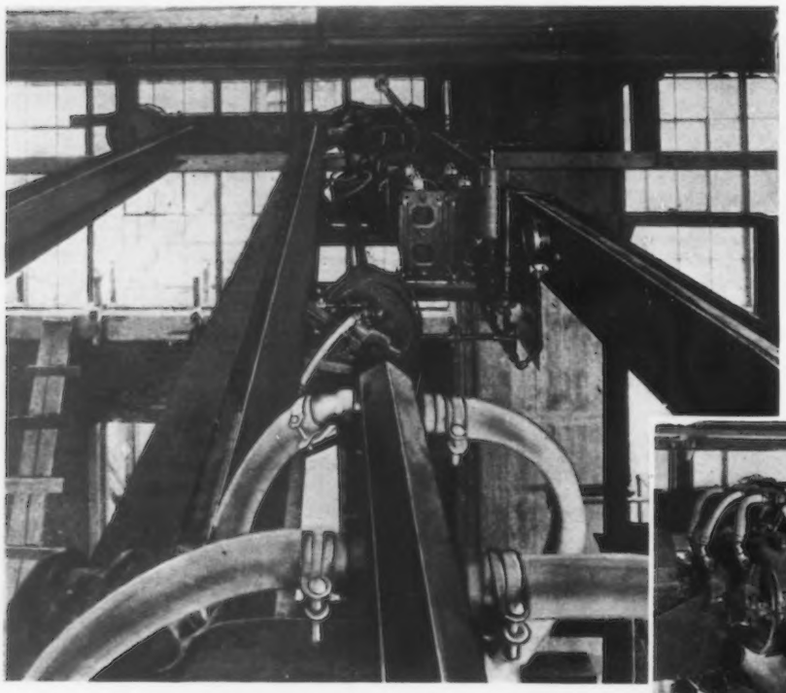
D-1 Rotor grinder with vitrified wheels; D-1 high production model, running 5400 r.p.m., with rubber bonded and bakelite wheels, on both cast iron and steel; Rotor sander finishing welds, with cup wheel, also sanding welds and automobile body parts, with Carborundum disk; D-3 grinder with vitrified wheel; D-3 high production model with rubber bonded and Bakelite wheels; new E-5 drill, 29/32 and 1¼ in. capacity; new E-7 drill, 1¼ in. heavy duty and 2 in., both drills rigged up for reaming demonstrations as well as drilling; new quick-as-a-wink buffing wheel, shown on type D-1 Rotor buffer; new type of buffing wheel utilizing straight strips of abrasive and giving flat contact. Representatives attending: H. P. Bailey, president; K. L. Pohlman, vice-president; F. R. Moore, G. O. Singer, L. K. Berry.

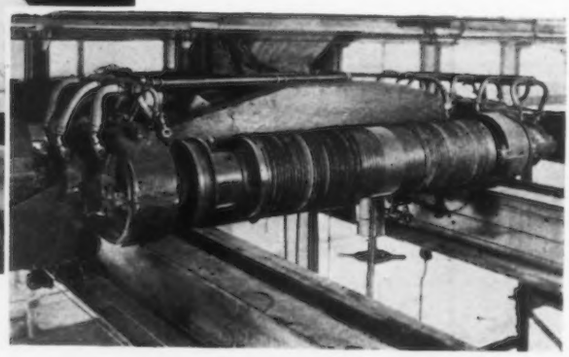
*(Continued on page 1238)*

## Forced Lubrication System on Overhead Crane

ONE foundry using five overhead electric traveling cranes found it possible to dispense with one of them, through improvement in operation of the other four from controlled lubrication. Elimination of delays and repairs is reported responsible for this result. The lubricating devices were installed by the Keystone Lubricating Co., Philadelphia. Two illustrations show how this equipment was put in. One is a general view of the lubricator installation on the bridge, while the other shows the installation on the trolley.

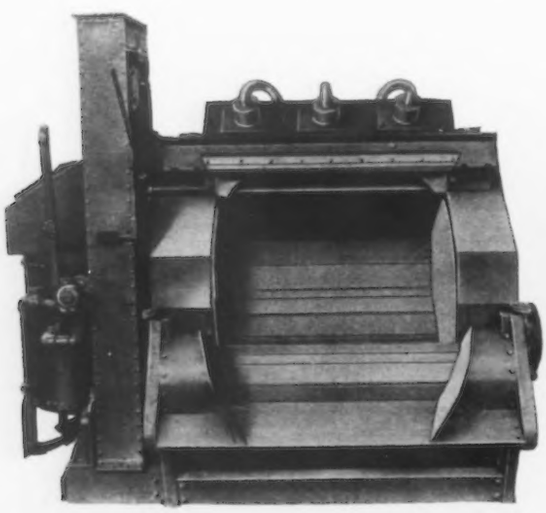
In the trolley view the hand wheel shown below the rope drum may be reached by the operator from his cab. The gage is hidden behind the drum in this view. Connections from manifolds are shown in both views; the gage and lubricator appear near the center of the general view. The truck wheels are designed for oil waste lubrication by capillary feed from below the journal. The grease line enters through the top of the bearing, the grease being discharged directly on top of journal. The wool waste is left in the box, acting as a wiper to collect and reapply the grease to the journal.

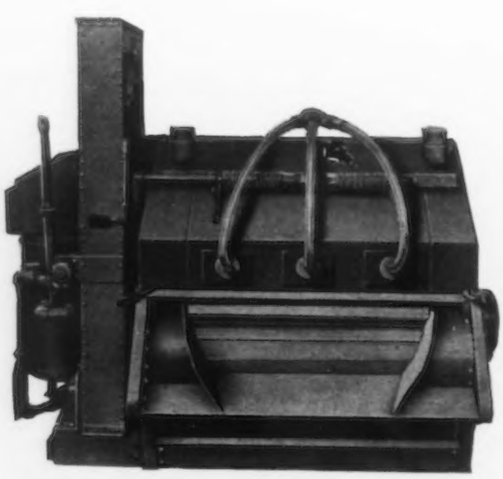




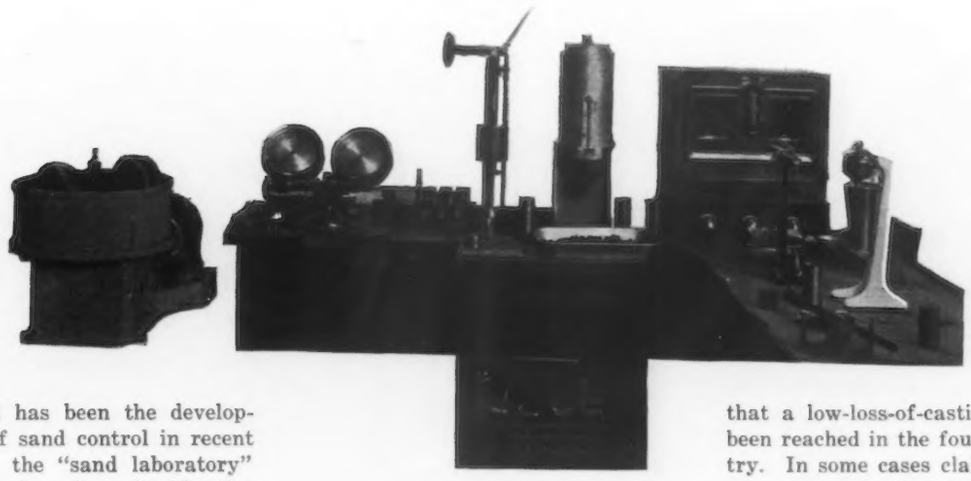
## Quick Loading in New Blasting-Tumbling Application

REDUCTION of cleaning costs in the foundry is the purpose of a new application of the blasting-tumbling idea which has been made by the American Foundry Equipment Co., Mishawaka, Ind. The device consists of an incased apron conveyor that travels from front to back. It will take 2000 lb. or more of castings, which are continuously cascaded into position in front of the three blast nozzles. At the conclusion of the operation the conveyor travel is reversed and the load is fed onto an unloading belt or convenient receptacle. Features claimed for the device are quick loading, large capacity, easy inspection, reduced cleaning time, automatic unloading and elimination of dead areas.





## Sand Laboratory Has Come to Stay



SO rapid has been the development of sand control in recent years that the "sand laboratory" now takes its place beside the chemical and physical laboratories in many modern foundries. One of the outstanding achievements of the technical work of the American Foundrymen's Association in recent years has been the gradual development of methods of testing and of apparatus to control sand mixtures and the selection of sands. The picture here reproduced is representative of the modern sand laboratory as furnished by Harry W. Dietert, Detroit.

By the intelligent use of a sand laboratory it is generally conceded that a low-loss-of-casting era has been reached in the foundry industry. In some cases claims of a 50 per cent reduction in losses are recorded. One foundry goes on record to the effect that its losses in castings are now around 5 per cent as against 15 per cent before sand control by means of a sand laboratory was introduced. Evidently the sand laboratory has come to stay.

## Trucks for Various Foundry Uses

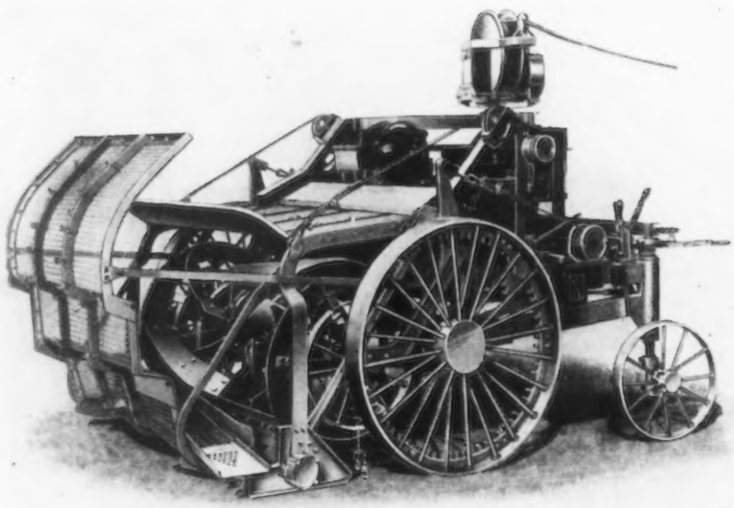
INDUSTRIAL trucks have been adapted for a number of purposes in the foundry. The illustration shows a Baker charging truck for charging castings into a malleable annealing oven. This truck has four-wheel steer for flexibility and is rated at from 4000 to 8000 lb. A similar type of truck equipped with a swivel crane and magnet has been successfully utilized in handling bagged castings, doing the work of seven or eight men. An elevating truck, equipped with duplex compensation suspension to eliminate jars in starting and stopping, is designed for handling fragile cores without breakage. These trucks are built by the Baker-Raulang Co., Cleveland.

## Simplified Optical Pyrometer

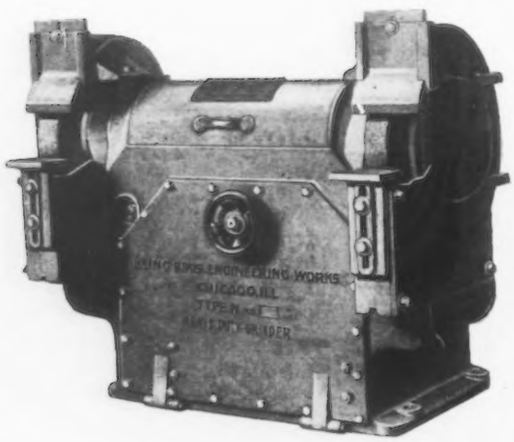
THE Pyrometer Instrument Co., New York, recently brought out a simplified optical pyrometer which combines lightness of weight (3 lb.) with other convenient features. Its overall dimensions are only 4 x 9 in. It is provided with a standard lamp which can be checked at the moment desired. The cylindrical casing contains the optical system, comprising adjustable objective, reflecting prisms, monochromatic red glass and adjustable eyepiece; the electrical system, comprising standard lamp, ammeter, rheostat, dry battery and press switch, and the diffusor and temperature scale. A flashlight battery suffices for the operation of the instrument. The light intensity of the hot body under observation is compared with that of a small electric lamp.

## Sand Preparator Screens, Aerates, Cuts and Piles

AFTER six years of experiments and tests, the American Foundry Equipment Co., Mishawaka, Ind., has placed on the market the American Preparator, a sand preparation machine. The Preparator screens, aerates, cuts and piles sand. The cutter blades throw the sand through a screen, and aeration takes place as the sand falls to the floor.



## High-Speed Heavy-Duty Grinder



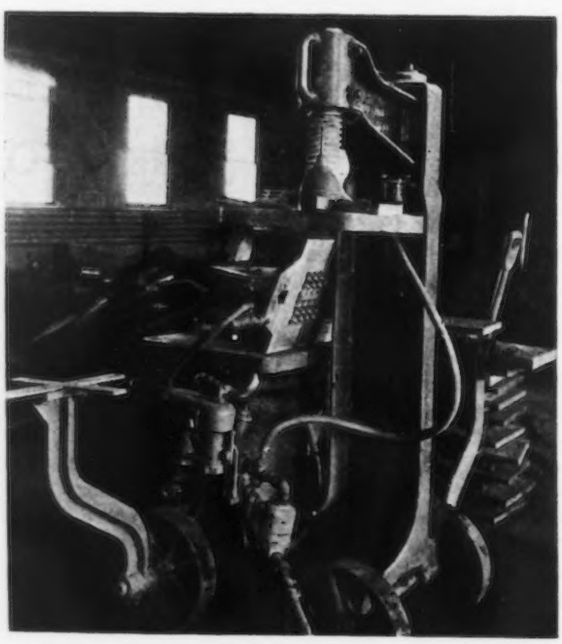
A HIGH-SPEED heavy-duty grinder built by the Kling Brothers Engineering Works, Chicago, is designed for grinding gray iron, malleable and steel castings and iron and steel forgings and for the job work of snagging and rough grinding.

Fitted with 24-in. wheels, the machine is 59 in. long, 38 in. wide and 49 in. high. It weighs about 3700 lb. and has a 15-hp. ball-bearing motor at 1800 r.p.m. The wheels are 3 in. thick and run at a constant peripheral speed of 8500 ft. a minute. As the chucks upon which they are mounted require a 12-in. bore, they allow for grinding to a 14-in. diameter. This gives a minimum of stub loss and maximum grinding service.

## Compressed Air Separator Drains Out Water

THE illustration shows a ⅜-in. Gast compressed air separator furnished by the Smith-Monroe Co., South Bend, Ind., installed on a molding machine to eliminate the troubles sometimes experienced from condensation of the water content of the air. Moisture in the air sometimes causes the vibrator to congeal and stick. The separator is relied upon to avoid this and at the same time to provide dry, clean air for the air gun. It is drained by a small air cock which is opened periodically by the operator.

As it is important that moisture be excluded from the air on sand blast equipment, particularly where steel abrasives are employed, this same device is designed for such use. Here a larger size is designed to effect entire removal of the entrained moisture. It is fitted in this case with an air trap, to drain it automatically. For this service a 2-in. separator is customarily used.

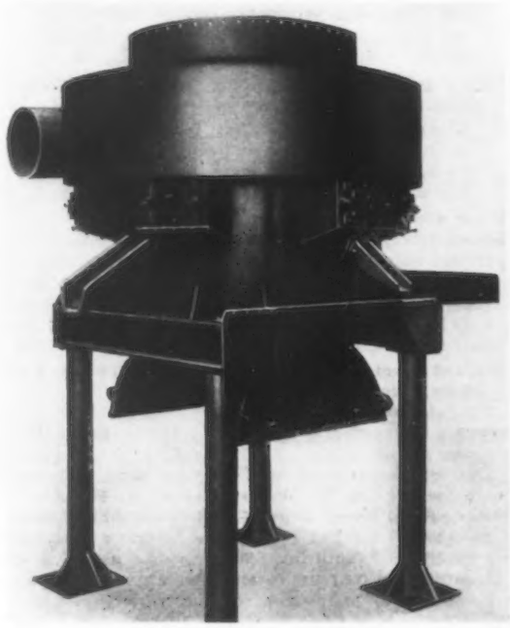


## New Model B Whiting Cupola

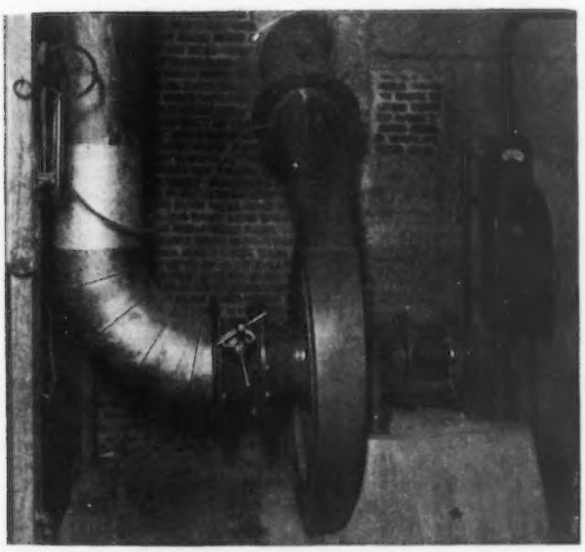
A NEW foundry cupola, model B, is being introduced by the Whiting Corporation, Harvey, Ill. One of the improvements is a heavy structural bottom plate fabricated from boiler plate and structural shapes, to do away with the cracking and distortion sometimes experienced with cast iron plates, and, of course, to prevent leaks in the windbox resulting from the distortion. The model B has straight cylindrical columns of wrought steel, which are filled with concrete when installed. This also helps to overcome the danger of cracking when they are exposed to the heat of the drop and cooling water is thrown on them.

The company for the safety opening has provided a fusible lead plate of some size, tightly clamped in a vertical position so that it will not become covered with coke, etc. The safety channel is merely a depression in one tuyere, 2-in. deep, leading to the safety spout.

The windbox is placed above the tuyere boxes or elbows, to eliminate the possibility of iron and slag flowing into the wind chamber, and the joints of the windbox are welded. The windbox and tuyere elbows are relatively larger than usual.



## New Cupola Blowing Equipment



THE General Electric Co., Schenectady, N. Y., has brought out a cupola blowing equipment of a new type rated 2800 cu. ft. of air at 1-lb. pressure, at 3500 r.p.m. It is designed to insure the supply of a constant weight of air to the cupola, irrespective of atmospheric conditions and the resistance through the cupola. Instead of operating the cupola by supplying a constant volume of air, or air at a constant pressure, it supplies a constant weight of air or oxygen. The idea is that a definite weight of oxygen is required to burn a certain weight of coke.

The equipment can be used with either hand or automatic control, and can be set to give the desired weight of oxygen to meet varying operating conditions. The weight is not controlled by variable speed, but by opening and closing the blast gate.

## Modifications Add to Flexibility of Elevating Truck

ATTACHMENT of underslung forks for picking up heavy flasks has adapted the elevating platform truck shown for work which cannot readily be done by man power. The truck, which is built by the Yale & Towne Mfg. Co., Stamford, Conn., may also be modified by the attachment of extended arms or rams on the platform for the handling of very heavy castings, such as boiler sections. The flexibility of the truck is designed to speed up the flow of materials in process and the lifting features often enable the saving of considerable space in storing foundry products.

**Royer Foundry & Machine Co., Wilkes-Barre, Pa. Booth Nos. 471, 473, 475, 477, 479.**
Royer sand separator and blender. Representatives attending: G. F. Royer, president; John Lloyd, vice-president; S. B. Davies, treasurer.

**Ruemelin Mfg. Co., Minneapolis, Minn. Booth No. 455.**
Sand blast guns, sand blast generators, sand blast cabinets, exhaust fans. Representatives attending: Richard Ruemelin, president; Harold Flitz.

S

**Safety Equipment Service Co., Cleveland. Booth No. 204.**
Super-Drednaut line of goggles, Dr. Woos respirator, Kleanair respirator, Safety Service shoes, Keyfel leggin, spring knee leggin, asbestos gloves, asbestos and F. P. suits, Adjusto ladder shoes, various other safety devices and appliances. Representative attending: B. W. Nutt.

**Sager Glove Co., Chicago. Booth No. 250.**

**Semet-Solvay Co., New York. Booth No. 328.**
Semet-Solvay foundry coke. Representatives attending: E. J. Burnes, D. S. MacEachern, D. H. Putnam, E. J. Rowe, W. S. Shelow, R. H. Watson, Samuel Weiss, J. M. Woods, A. F. Stengel.

**Service Caster & Truck Co., Albion, Mich. Booth No. 366.**

**Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. Booth Nos. 12 to 16.**
Electric cranes and hoists.

**Shevlin, Carpenter & Clarke Co., Minneapolis, Minn. Booth No. 11.**
Lumber for foundry and pattern shop. Representatives attending: N. H. Morgan and H. A. Habeck.

**Simons Paint Spray Brush Co., Dayton, Ohio. Booth No. 43.**
Mechanical method of painting interiors of foundries and other manufacturing plants by the use of a spray gun outfit operated by compressed air. Spray can also be adapted to painting of castings.

**W. W. Sly Mfg. Co., Cleveland. Booth Nos. 346, 348, 350, 352, 354, 356, 358, 360.**
Slyblast room, positive pressure rotary table, Nos. 00 2 and 4 tilted mills, tumbling mill, dust arrester, sand reclaiming system. Representatives attending: S. C. Vessy, president; George A. Boesger, chief engineer; F. A. Ebeling, sales manager; L. B. Brewster, C. P. Guion, M. T. Mortensen, D. L. Harris, W. L. Kammerer, R. W. Hasselle.

**Werner G. Smith Co., Cleveland. Booth Nos. 255, 308.**
Samples of Linoil and other core oils and specimen cores. Representatives attending: Werner G. Smith, president; N. A. Boyle, treasurer; Milton S. Finley, vice-president; Frank H. Dodge, Dr. F. S. Havens, George H. Graham, I. R. Gerteis, L. P. Robinson, L. F. Ferster,

**THE IRON AGE will occupy Booth No. 1 at the exposition of the American Foundrymen's Association in Philadelphia the week of May 14. Representatives of the editorial, advertising and subscription departments in attendance.**

Wallace Alexander, William Rayel, George Furman, Thomas Procter, M. M. Werckman, John M. Glass, A. S. Coulter.

**Smith-Monroe Co., South Bend, Ind. Booth No. 177.**
Gast compressed air separators. Representatives attending: R. O. Monroe, A. F. Squier.

**Smith Oil & Refining Co., Rockford, Ill. Booth No. 235.**
Core oil and liquid rosin. Representatives attending: Omer S. Smith, Stanton K. Smith, Frank C. Maley.

**Spencer Turbine Co., Hartford, Conn. Booth No. 391.**
Spencer turbo-compressors for supplying air for foundry cupolas, oil and gas burning industrial furnaces, etc. Representatives attending: S. E. Phillips, F. A. Wright, O. J. Dingee, F. D. Bailey.

**Springfield Facing Co., Springfield, Mass., and Newark, N. J. Booth No. 41.**
Foundry facings and supplies. Representatives attending: L. S. Brown, president; H. E. Beckman, general manager; H. Z. Dingee, vice-president; William Lawson, Frank Kumer, Harold Hamlen, F. P. Bullion.

**Standard Sand & Machine Co., Cleveland. Booth No. 67.**
Exhibiting latest model core and facing sand mixer, equipped with motor and speed reducer, Timken bearings and hexagonal screen. Representative attending: Harry E. Boughton, vice-president and general manager.

**Sterling Wheelbarrow Co., Milwaukee. Booth Nos. 324, 326.**
Foundry flasks, trucks, shop boxes, wheelbarrows, casters, wheels and other foundry specialties. Representatives attending: H. H. Baker, secretary; R. F. Jordan, assistant sales director; G. H. Lambkin, J. M. Dickson, H. J. Felsburg, L. P. Robinson, J. A. Patterson, J. J. Coyne, O. E. Steep.

**Frederic B. Stevens, Inc., Detroit. Booth No. 91.**
A general display of foundry facing, foundry supplies and foundry equipment; also a working model of the Auto-Plate. Representatives attending: Frederic B. Stevens, president; W. H. Joseph Cluff, vice-president; John M. Mayers, secretary; Lewis H. Kirby, treasurer, and branch managers.

**Stoney Foundry Engineering & Equipment Co., Cleveland. Booth Nos. 452, 454, 456.**
Shakeout bail, vibrators, core knockout machine (standard "B" type), knockout machine (bench type), core grinding machine, ladles, hose clamps and fittings. Representatives attending: E. S. Cohen, L. J. Reinhard, G. A. Scott.

**Sugar Pine Exhibits, San Francisco. Booth Nos. 77, 78.**
Lumber for foundry uses.

**Sullivan Machinery Co., Chicago. Booth Nos. 457, 459.**
A Sullivan angle compound compressor in operation to supply other exhibitors with compressed air; a Sullivan class WG-6 12 x 10 straight line single-stage, belt-driven compressor; a new Sullivan two-cylinder vertical compressor, type WL-22, direct connected to a 25 hp. motor, all mounted on a self-contained base; two Sullivan portable hoists suitable for car pulling, light hauling, and miscellaneous industrial jobs. Representatives attending: Howard C. Sargent, E. F. Pie, L. R. Chadwick, Oscar R. Cundy, and Robert H. Moth.

**Superior Sizing Co., Inc., Lockport, N. Y. Booth Nos. 240, 242.**
Core oils and parting. Representatives attending: R. M. Snell, E. J. Johnstone, F. A. Roehlk, C. E. Schaad, J. E. Kershaw, Harry Knight, Joseph M. Remmes.

**Swan-Finch Oil Corporation, New York. Booth No. 297.**
Core oils specialist. Representatives attending: Nelson V. Joyce, vice-president; H. F. Moncrieff, J. W. Closterman, Jesse Jones, T. L. Brennan, G. S. Robinson.

**Swartwout Co., Cleveland. Booth Nos. 18, 20.**
Ovens (core baking and mold drying). Representatives attending: C. F. Mayer, C. J. Pimsner, H. A. Bogardus.

T

**Tabor Mfg. Co., Philadelphia. Booth Nos. 54 to 66.**
Complete line of foundry molding machines, including several new types never before exhibited. Representatives attending: Wilfred Lewis, president; F. R. Wallace, vice-president; Robert M. Maull, secretary and treasurer; J. T. Ramsden, R. H. Wiensner, Philip J. Shire, James H. Coleman, Harry W. Impey, John Pfendner, William E. Sewell, Thomas L. Sumner, John A. Rathbone, E. A. Platt.

**Titgen-Eastwood Co., Philadelphia. Booth No. 316.**
Cupolas and sand blast equipment. Representatives attending: Harry W. Titgen, A. B. Eastwood, William Dunbar, Christian Gunther.

**Tinoa Petroleum Co., Philadelphia. Booth No. 364.**

**Tottenville Copper Co., Tottenville, N. Y. Booth No. 149.**

**Truscon Steel Co., Youngstown. Booth Nos. 412, 414.**
Alloy steel flasks for a large variety of jobs; also foundry accessories such as gaggers, flat bands, pouring jackets, bottom boards, core plates and core racks; various types of steel platforms for handling sand, castings and other materials with greater efficiency. Information regarding Truscon industrial buildings available. Representatives attending: N. C. Ferreri, G. E. Madden, A. W. Ferguson, F. J. Vlaskamp, A. L. Abrahams.

**Twentieth Century Woodworker, Philadelphia. Booth No. 120.**

**W. S. Tyler Co., Cleveland. Booth Nos. 171, 173.**
Hum-mer electric screen for reclaiming and screening foundry sand; Ro-Tap testing sieve shaker; Tyler standard screen scale testing sieves, and samples of wire cloth in various metals, meshes and weaves suitable for foundry use. Representatives attending: N. E. Kile, M. D. Pugh, D. V. Vigneron.

U

**United Compound Co., Buffalo. Booth No. 206.**

**United States Electrical Tool Co., Cincinnati. Booth Nos. 183, 185, 187, 189.**
Electric drills, drill stands, electric blower, disk sander, high-cycle drills and grinders, multispeed grinders, light and heavy-duty grinders, combination disk grinder, motor-in-the-base selective speed buffers. Representatives attending: H. N. Kelsey, W. B. DaSilva, W. R. Dorsey, C. G. Cresswell, M. A. Weidmayer, G. M. Lawrence, G. E. Smith.

**United States Graphite Co., Saginaw, Mich. Booth No. 226.**
Complete line of Mexican graphite foundry facings and core washes and other graphite products. Representatives attending: J. J. Edmiston, O. R. Miller.

V

**Vesuvius Crucible Co., Swissvale, Pa. Booth No. 245.**

W

**Wadsworth Core Machine & Equipment Co., Akron, Ohio. Booth No. 219.**
Core making machines, core cutting-off and coning machines, core testing machines, steel core plates, steel bottom plates. Representatives attending: George H. Wadsworth, M. C. Sammons.

**White & Brother, Inc., Philadelphia. Booth No. 227.**
Ingot brass, casting copper, lead, solder, babbitt metal. Representatives attending: Clarence B. White, Harry A. White, John T. Fegley, Raymond Hunter, Frank Ogden, Frank Krug, Irving G. Smith.

**Whitehead Brothers Co., New York. Booth No. 144.**
Molding sands and foundry supplies. Representatives attending: A. J. Miller, J. H. Whitehead, V. L. Whitehead, Jr., C. E. Andrews, R. L. Carpenter, H. J. Gerrard, R. J. Hashagan, T. F. Hogan, A. J. Miller, Jr., B. D. Fuller, A. J. McBride, A. Y. Gregory, F. B. Clarke.

**Whiting Corporation, Harvey, Ill. Booth Nos. 321 to 327, 374 to 380.**
New style steel plate tumbling mill equipped with our positive door clamp, combination clutch and brake and motor for operation; cloth screen dust filter; helical worm-geared crane ladle, new style, with ball thrust bearings; new model "B" Whiting cupola; 5-ton electric crane trolley in operation; photographs, drawings, etc., of cranes and foundry equipment. Representatives attending: J. H. Whiting, chairman; T. S. Hammond, president; A. H. McDougall, vice-president; M. J. Evans, sales manager; R. E. Prussing, vice-president; R. H. Moore, F. P. Walsh, J. R. Bates, H. E. Reynolds, S. R. Vanderbeck, M. F. Beetham.

**Wilbraham Green Blower Co., Pottstown, Pa. Booth No. 373.**

**G. H. Williams Co., Erie, Pa. Booth No. 163.**
Miniature model crane operating miniature bucket. Representatives attending: W. C. Swalley, acting general manager; T. D. Harter, assistant general manager.

**J. E. Williams Shoe Co., Spring City, Pa. Booth No. 234.**
Patented safety shoes, in Congress and lace styles. Representatives attending: James E. Williams, George S. Peterman.

**E. J. Woodison Co., Detroit. Booth No. 57.**
Foundry supplies, core room and molding machines. Representatives attending: E. J. Woodison, president; J. C. Woodison, vice-president; C. D. Yahne, treasurer; G. A. Burman, W. J. Wark, R. S. Hoffman, L. A. Dawson, B. E. Beldin, F. W. Blanchette, R. G. Fritts, F. W. Shortsleeves.

**T. B. Wood's Sons Co., Chambersburg, Pa. Booth No. 146.**
Equipment for the Wood system of molding, comprising the Peerless aluminum tapered slip flask, the Peerless cherry wood tapered slip flask, and the automatic adjustable slip jacket in various sizes adapted to a wide range of work. Representatives attending: T. B. Wood, superintendent; W. H. Fisher, vice-president and secretary; Charles M. Wood, Victor Leisher, George W. Leisher, A. H. Slothour.

Y

**Yale & Towne Mfg. Co., Stamford, Conn. Booth Nos. 318, 320.**
Chain blocks, electric hoists, overhead cranes, electric industrial trucks, tractors and trailers. Representatives attending: H. J. Fuller, R. B. Kite, M. G. Peck, George Sherrill, W. T. S. Quicke.

**Young Brothers Co., Detroit. Booth Nos. 79, 80.**
Full size power conveyor oven in operation; an operating model of an overhead horizontal conveyor type core oven; laboratory oven; photographs of installations. Representatives attending: C. G. Lisch, V. A. Fox, T. P. McVicker, G. I. Thatcher, G. H. Walsh, P. A. Meyer.

Z

**Zanesville Sand Co., Zanesville, Ohio. Booth No. 147.**

# Officers and Directors for 1928-1929

S. T. JOHNSTON
Incoming President

S. W. UTLEY
Outgoing President

FRED ERB
Incoming Vice-President

C. E. HOYT
Secretary-Treasurer

## *New Directors for Three Years*

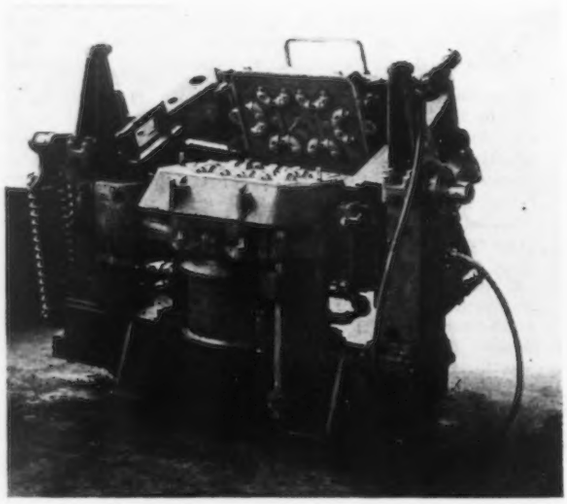
L. W. OLSON

P. J. KRENTZ

B. F. JOHNSON

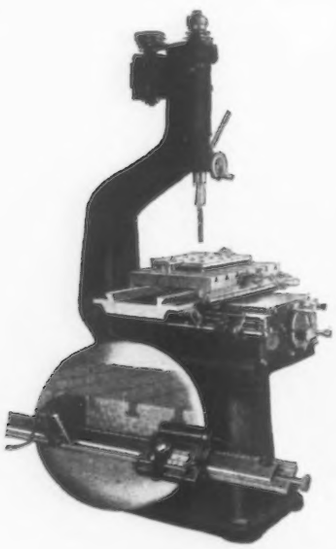
## Multiple Molding Machine Has Power-Operated Head

THE power-operated head in the new multiple molding machine brought out by the Tabor Mfg. Co., Philadelphia, relieves the operator of a tedious operation and further simplicity in operation is achieved by the arrangement of the guides so that the two heads are guided in all directions and may be readily adjusted. The drawing speed and vibration operation are automatic. A special type of swinging yoke is used and alinement between the upper and lower head while squeezing is insured.



## Self-Contained Layout Table

FOLLOWING the introduction last year of the Kellocater layout table, the Keller Mechanical Engineering Corporation, Brooklyn, encountered a demand for a complete self-contained unit with overarm, spindle and base, and accordingly has developed such a machine. The overarm is equipped with a hardened and ground spindle and with a No. 1 Morse taper hole for drills up to ½ in. The vertical motion of the spindle is equipped with hand screw feed, capable of boring a hole up to 2 in. Eight spindle speeds are provided, ranging from 175 to 3500 r.p.m., four speeds being through back gears and four through open belt.



## Air-Tool Grinding Cuts Time

BY substituting air-tool grinding for hand filing, the V & O Press Co., Hudson, N. Y., has cut the time to one-third of that formerly taken in grinding the small radii of a fly-wheel web. The work at the V & O plant is now done by a 2¼-in. diameter cone shaped wheel furnished by the Rotor Air Tool Co., Cleveland.

## Air-Driven Portable Grinder

A PORTABLE grinder now made by the Buckeye Portable Tool Co., Dayton, Ohio, is air driven and operates on a rotary principle, emphasized as reducing vibration to a minimum and providing a smooth running constant source of power. The high-speed grinder is within the safety code rating, attaining a surface speed of 8000 to 9000 ft. per min. The grinder may also be procured in ratings from 4800 to 6200 r.p.m. Bakelite, rubber or other elastic bonded wheels are used, and the tool is made in a number of models, sizes and speeds for various classes of work.

# Present Status of Pearlitic Iron

## What It Actually Is—Separate Foundry Needed to Produce It—Advantages and Disadvantages Involved—Similar to High-Test Irons

BY DR. RICHARD MOLDENKE*

CONSIDERABLE attention has been directed recently to a class of cast iron exhibiting a pearlitic microstructure. Pearlite, it will be remembered, is a grouping of alternate layers of pure iron—called ferrite in micrometallurgical parlance—and iron carbide, similarly called cementite. The microscopically small particles of hard cementite, separated from each other by equally small particles of soft iron, together with what graphite may be there, present a metal which seems to wear better than when made up of either component, and it can also be more readily machined. Since much of the newly developed "high-test" cast iron, with the astonishingly high strength values, exhibits the same pearlitic microstructure, though produced under entirely different conditions, a discussion of the present status of so-called pearlitic cast iron is appropriate at this time.

### Pearlitic Iron Falls in Low-Silicon Ranges

In contrast with the new high-test cast irons, those irons designated particularly as pearlitic fall within the low-silicon ranges. The reason for this is connected with the slow rate at which the molten metal is allowed to cool in setting. In the production of cast iron the rate of cooling the molten metal is most important, and this rate is fastest when pouring it into iron molds, which chill the metal. A slower rate of cooling is had with the green sand mold, where the damp sand lowers the metal temperature rather rapidly in the case of thin castings. Dry sand molds cool the iron still more slowly than green sand molds; but the slowest rate of the entire series exists when sand molds are not only dried, but are actually brought up to an almost incipient red heat.

It will be readily appreciated that a cast iron of the ordinary silicon range stipulated for, say, machinery castings, will chill but very little in an iron mold at room temperature, will be reasonably fine-grained in green sand, a little coarser in dry sand, but will be soft and coarse grained to the extent of practical uselessness when made in a highly heated sand mold. Hence, castings thus produced must be quite low in silicon to be acceptable, apart from their pearlitic microstructure.

### Silicon Content and Mold Temperature Chief Factors Involved

Coming down to practical considerations, the two chief factors to be considered are the silicon content of the molten iron and the sand mold temperature, for these have the greatest effect upon the amount and condition of the graphite formed. Where a gray iron only is demanded, the range of each factor is necessarily large, for one can begin with either a green sand or dry sand mold at room temperature and the highest point on the silicon range involved and go successively up to an almost red hot mold with the silicon down to 0.50 per cent, and always have a gray iron casting. But only the upper end of mold temperatures with the lower end of the silicons will give a gray iron casting with the desired pearlitic structure.

The idea of using hot molds with lower-range silicon mixtures is not a new one with foundrymen, though they were probably not aware of the specially good structures attained. Professor Lanz and Director Sipp of Germany, however, went into this matter thoroughly and constructed tables of correlated compositions and mold temperatures, giving recommended combinations for the several metal-section conditions found in light and medium castings—for heavy work does not seem to be so readily controlled. These correlations are covered by the patents granted in the industrial countries, other combinations of composition and mold temperature, as well as the pearlitic character of the metal itself, being without the range of a patent monopoly.

It is further understood that considerable in the way of expert practical manipulation is required to get satisfactory results. This will be appreciated by foundrymen experienced in low-silicon work, for the volume reduction in the setting of such metal—perhaps twice that of high-silicon irons—means extraordinary attention to the gating of the molds, the design of the castings and more particularly the cupola melting operation, which is that of making cupola-malleable cast iron. The chances for oxidation, unless small charges, a high bed and plenty of intermediate coke are used, are such that larger-section castings often show up large internal shrinkages because of either improper gating or, more likely, on account of a serious reduction in the time interval between pouring and setting temperatures, which cut off the proper feeding of the mold in spite of what should be an extension of the rate of cooling by reason of the highly heated sand.

### Advantages and Disadvantages of Pearlitic Iron

There remains, then, but to contrast the advantages and disadvantages of making pearlitic cast iron. These are as follows: When highly superheated in melting and not oxidized, with gating and risers properly placed, the iron is fairly fine grained and dense. It is strong, and has excellent wearing qualities. The disadvantages are that it is not easy to produce without much experience with low-silicon cupola mixtures. Extra care is required with pattern equipment, gates and risers. It is necessary to install mold-heating ovens allowing high-temperature operation and flexibility of operation for pouring off.

But most serious is the fact that no sane foundryman will want a low-silicon operation side by side with his ordinary mixtures in the same building. Sooner or later iron will get into the wrong molds, the sprues will be mixed, and confusion will result, with large scrap piles. Hence pearlitic cast iron should only be made with a separate melting installation and in a special building.

Highly super-heated cast iron mixtures, supercooled before pouring off, with not too long a rate of cooling to give large graphite crystals, yield remarkable high-test iron castings, exhibiting much of the pearlitic structure, but the outlook for low-silicon pearlitic cast iron is not very bright if a special foundry has to be provided. Nevertheless, there is no reason why this kind of iron may not be made a specialty by foundries looking for new markets for their output.

*Consulting foundry engineer, Watchung, N. J.

# Welding Chrome Irons and Steels

## Must Prepare a Clean Joint, Use a Proper Flux and a Strictly Neutral Flame of Minimum Dimensions, Ending with a Properly Adjusted Heat Treatment

INFORMATION on welding chrome irons and steels is given in the April issue of *Oxy-Acetylene Tips*, the monthly publication of the Linde Air Products Co., New York. This company is closely associated with Electro Metallurgical Co. and the Union Carbide & Carbon Research Laboratories, which have been responsible for many advances in high-chromium alloys.

For the purposes of discussion, commercial high-chromium alloys may be classified as follows:

| | Name | Carbon, Per Cent | Chromium, Per Cent | Nickel, Per Cent | Silicon, Per Cent |
|---|---|---|---|---|---|
| Group I | Rustless chromium irons | less than 0.12 | 12 to 18 | .... | 0.3 to 1.2 |
| Group II | Stainless chromium steels | over 0.30 | 11 to 17 | .... | .... |
| Group III | Rustless chrome-nickel irons | less than 0.17 | 17 to 25 | 7 to 9 | .... |
| Group IV | Chrome-nickel-silicon alloys | | | | |
| | Class I | .... | 17 to 19 | 24 to 26 | 2.5 to 3 |
| | Class II | .... | 25 to 27 | 20 to 22 | 2 to 3 |
| | Class III | .... | 7 to 9 | 20 to 22 | 1 to 2 |
| Group V | Extra high chromium irons | less than 0.30 | 25 to 30 | .... | .... |
| Group VI | Castings | higher | .... | .... | .... |

Under proper conditions, and with proper procedure, all these can be welded with the oxy-acetylene flame. Difficulties in making a sound, clean joint increase as the chromium content increases, as a result of the formation of infusible oxides, consisting chiefly of chromium oxide together with smaller amounts of iron oxide, manganese oxide and silica. Ordinary fluxes for welding or brazing are therefore unsatisfactory. Fluxes must be sufficiently fireproof to protect adequately the molten metal and hot metal adjacent to the weld from oxidation, and must be correctly compounded to dissolve the refractory chromium oxide with ease. A specially designed flux, known as "Cromaloy Flux," is recommended.

Rustless chromium irons of Group I are used chiefly as sheet metal, and as such are frequently welded into vats, tanks and container linings. Up to 16 gage, welds are usually made between upstanding flanged edges, turned 1/16 in. high. The sheet is carefully cleaned of scale and dirt along the edge, and painted *top and bottom* with a water paste of cromaloy flux. Then the joint is assembled with clamps and the upstanding edges are melted together in the usual way.

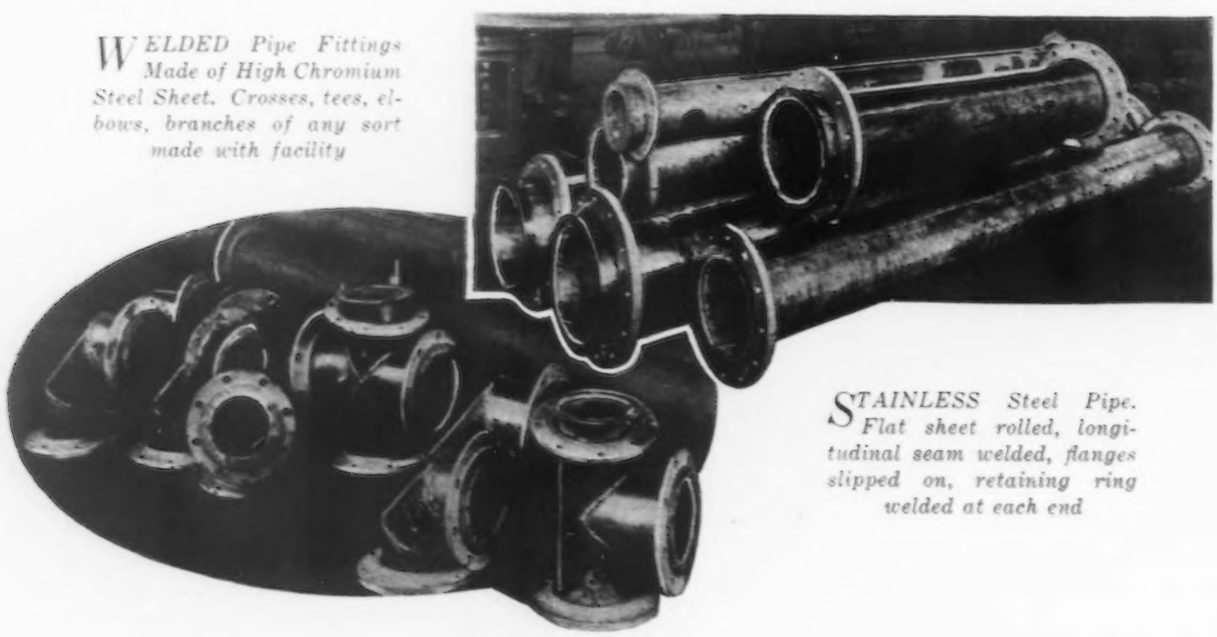
A most important detail of correct practice is to use a neutral flame just large enough to insure proper fusion, since too large a tip causes the molten metal to boil and results in porous welds. An excess of acetylene will cause an increase in the carbon content of the metal in the weld, lowering its resistance to corrosion. It will also increase the hardness and lower the ductility of the weld metal. An excess of oxygen results in dirty metal and porous welds, because of the excessive formation of infusible oxide.

With the aid of rods of the same composition as the base metal, good butt welds can be obtained in metal 1/16 to 1/8 in. thick, without beveling. Flux should be applied to the line of the weld on both the top and bottom surfaces of the sheet. This prevents oxidation on the under side and allows good fusion and union to take place under the protecting film of slag. Without the use of flux, it will be impossible to obtain complete fusion at the bottom of the seam. The rod should be clean and painted with a thin coating of the flux.

In making welds in heavier gages, the plate is beveled and the faces of the bevel are coated with the flux. The welding should be carried through to completion rapidly and, if possible, should be of the single vee type.

### Heat Treatment of Welded Joints

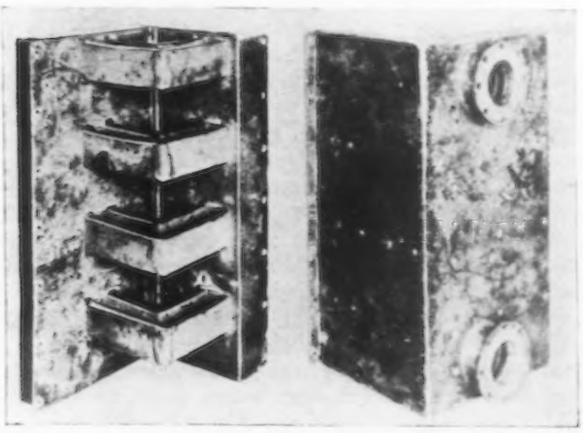
As a result of the high temperature attained during welding, the structure of rustless iron is changed within the weld metal and in adjacent portions of the sheet. Rustless irons, particularly those containing 12 to 14 per cent chromium, are subject to air-hardening, and require annealing to soften and toughen the metal at the joint. Best results are obtained by heating the



*WELDED Pipe Fittings Made of High Chromium Steel Sheet. Crosses, tees, elbows, branches of any sort made with facility*

*STAINLESS Steel Pipe. Flat sheet rolled, longitudinal seam welded, flanges slipped on, retaining ring welded at each end*

welded part in a furnace at a temperature between 650 and 700 deg. C. for a half hour, and allowing it to cool slowly, either in the furnace or in warm, quiet air. The blowpipe is often utilized for applying the heat in cases where it is not possible to employ furnaces. Great care must then be exercised to heat the metal no more than the maximum temperature given. The benefit to be derived from blowpipe annealing will depend on the care used in controlling the temperature and time of heating. Usually about 3 min. within the above temperature range will have some softening effect, but a longer time is to be preferred. The temperature may be judged by touching the hot metal with a piece of pure aluminum wire (melting point 658 deg. C.). A tiny liquid drop of aluminum



*Recuperator of High-Chromium Steel before Assembly*

should remain. A dull red heat just discernible to a keen eye is about 700 deg. C., the top limit for annealing.

Tensile tests show the results obtained from welds in 18-gage rustless iron:

| Condition | Yield Point, Lb. per Sq. In. | Ultimate Strength, Lb. per Sq. In. | Per Cent Elongation in 2 In. Over Weld | Remarks |
|---|---|---|---|---|
| Unwelded | 53,000 | 78,200 | 36.0 | Per cent elongation over fracture |
| As welded | 32,400 | 43,700 | 4.0 | Broke in sheet near weld |
| Blowpipe annealed | 55,350 | 76,400 | 6.5 | Broke in weld |
| Furnace annealed | 45,400 | 72,900 | 7.6 | Broke in sheet and edges of weld |

The higher silicon content found in some of the commercial grades facilitates welding. Higher chromium rustless irons have less tendency to air-harden but are more subject to grain growth in the weld and base metal adjacent. Excessive grain growth results in a brittle condition, which can be remedied, particularly on light gages, by annealing at 650 to 700 deg. C. for 3 min. and air-cooling.

After furnace annealing, welds in 16-gage material will stand considerable bending without fracture.

### Cutlery Steels Infrequently Welded

Stainless chromium steels of Group II are used for cutlery and heat-treated machine parts, and are therefore seldom welded. Procedure as outlined above will make a joint which is extremely hard and brittle, due to its air-hardened condition. Furnace annealing at 750 to 800 deg. C., followed by very slow cooling, is necessary to make the weld machinable. A second suitable heat treatment is then required to restore stainless properties to the entire part.

### Rustless Chrome-Nickel Irons Give Ductile Welds

Alloy irons of Group III containing chromium and nickel are not subject to the brittleness encountered in the former types of alloys after being exposed to the heat of the welding blowpipe. They do not air-harden, and weld metal cooled either rapidly or slowly is malleable and ductile and therefore requires no heat treatment. Whenever the welding of high-chromium alloys must be considered, the use of alloys of this group is recommended both on account of the easy weldability and of the superior physical properties of a weld completed without heat-treating or annealing. Best results are obtained with the use of cromaloy flux. Welds in 18-gage sheet will have a yield point of 50,000 to 60,000 lb. per sq. in., an ultimate strength of 65,000 to 70,000 lb. per sq. in., with about 15 per cent elongation in 2 in. over the weld. Blowpipe annealing or any simple annealing does not improve the quality of welds in this material and is not recommended.

Alloys of Group IV have been developed to meet special industrial demands. They are all easily welded, but joints in thicker gages or sections must be made in such a way as to reduce residual or internal stresses to a minimum, because most of the alloys are red short. No subsequent heat treatment is necessary or recommended.

### Extra High Chromium Induces Brittleness

Alloys of Group V are characterized by great resistance to oxidation and chemical corrosion. On account of their high chromium content they present some difficulty in welding when ¼ in. or more thick,

*Welding Upstanding Seam at Corner of Tank*

because of the formation of infusible oxides or slag. The use of flux will help prevent oxide formation if painted along the clean edges of the seam and on the welding rod. Flange welds in thin material are easily made.

When subjected to the heat of welding, these alloys undergo considerable grain growth with resulting brittleness. This condition cannot be removed by annealing.

Much the best results are obtained by using flux and a strictly neutral flame. Welds may, however, be made in the metal with an excess acetylene flame without the use of flux, bearing in mind the fact that the welds will be hard, brittle, high in carbon and less resistant to chemical corrosion than the plate. This method of welding, however, suffices for annealing boxes which are not to be treated very roughly.

### Castings Should Be Welded Hot

Several grades of high-chromium castings are sold, some containing appreciable amounts of nickel or silicon or both. Castings, as a rule, contain considerably more carbon than the rolled products. For welding castings containing high carbon and designed for wear resistance, it is preferable to preheat to a good red

heat to avoid cracking. Cooling should be relatively slow; after this the entire casting may require further heat treatment to produce the necessary hardness. Welding rods of the same composition as the base metal should be used. An excess acetylene flame aids in welding and is permissible for castings which already have a high carbon content. For thin-walled castings, however, it is best to use a neutral flame and cromaloy flux. When using an excess acetylene flame, flux should also be used, since it facilitates fusion and assists in removing oxide and sand spots in defective castings.

# Qualifications for Welders

## American Welding Society in Annual Meeting Holds Symposium on Acceptance Tests for Workmen—Standardization for Code Purposes to Follow Detailed Study

TESTS whereby the skill of welders can be appraised before entrusting them with important work was the theme of the principal session of an American Welding Society meeting in New York last week.

Testing workmen is more than a mere mechanical operation, as pointed out by G. A. Caldwell, vice-president and general superintendent Mississippi Valley Structural Steel Co., St. Louis. In his opinion, character is the most essential qualification for a welder, and this can be appraised only by contact with the man. Hence his organization prefers to train its own welders, selecting those shop men of more than average ability who desire to become welders and who look upon welding as a skilled trade that will lift them above the humdrum routine. In most shops using welding the situation would be met in the same manner: by selecting a promising apprentice, having him work as helper to the best qualified journeyman, then using him for minor details where utmost quality is unnecessary, gradually increasing his skill by constant instruction and frequently breaking test welds and studying the results. Only as the force of welders increases is a supervisor necessary, together with more definite acceptance or appraisal tests before employing self-styled welders.

### Welds Appraised by Bending Tests

E. E. Shanor, vice-president Petroleum Iron Works Co., Sharon, Pa., agreed with Mr. Caldwell that apprenticeship is the best way to train welders—in his plant principally for production of large diameter pipe by automatic machines rather than hand welding structural steel. At Sharon the apprentice is given roustabout jobs for two months, to become acquainted with the plant and to test his mettle. Then he becomes a fitter's helper. After learning the essentials of joint assembly, he spends some time behind a pneumatic caulking or chipping hammer and another period as a helper on the testing machine (for each pipe section gets a hydraulic test). Meanwhile he is encouraged to try his hand at welding test pieces, and from then on his progress is about as sketched by Mr. Caldwell. In Mr. Shanor's organization a further step is taken after the man becomes a reasonably proficient hand welder, namely, he becomes a helper on a row of automatic machines, and finally a machine operator. Much information must be given him either through books or by word of mouth about the functions of the various electrical auxiliaries. The greatest aid to improvement is thought to be a broken practice weld, studied for blowholes, inclusions and adhesions. When butt welds can be consistently bent 180 deg. around a pin five times the thickness of the plate, the welder is regarded as proficient by the Petroleum Iron Works Co.

### Standard Acceptance Tests Not Yet Formulated

Speaking for the committee on qualification of welders, H. H. Moss, Linde Air Products Co., New York, said that it is proving difficult to prepare specifications on the subject, because the requirements for various types of production work are not only different for different classes of structures, but even in shops doing the same type of work the practices are not uniform. The committee has made a special study of pipe welding, of which a great deal is being done. All pipe welding is not alike; the welding ability required for joints on long lines for oil, gas, water or low-pressure steam is quite different from corresponding requirements of a worker on pumping station specials, high-pressure air, steam or hydraulic lines, or refrigerating systems. A proficient workman on rolling joints of the first classification should not, in Mr. Moss's opinion, be rated by the same tests which would seek out a man of far greater general ability for the second. In view of the many kinds of welding encountered in pumping station work—butt welds in all kinds of positions, double and single-vee welds in extra heavy metal, fillet welds on branches and the joining of steel castings to wrought pipe—the committee was undecided on the number and variety of tests for ability which should be specified.

Work on the qualifications of pipe welders, structural steel welders and pressure vessel welders is well under way, however, and must be pushed to conclusion so as to enable the society to cooperate with various code-formulating bodies now considering the matter. These regulations, when written, would have the effect of imposing upon industry certain tests, licensing or qualifications for the workman. This would doubtless work temporary hardship on many workmen and employers. The former can usually improve in skill readily. Manufacturers will also profit from a higher grade of welding through added neatness of the work, a higher reputation for dependability and an economic saving through the use of less metal and a 100 per cent joint.

### Simplicity Desirable

C. E. Loos, American Bridge Co., Ambridge, Pa., made a plea for simplicity in testing. In his opinion it is unnecessary to test the welder in every style of joint he would be called upon to make. In the structural field nearly all the joints are lap joints with fillet welds. In training, a welder makes such joints in great number, in plates of various thickness and arranged in various positions. He splits these apart and studies them for penetration, fusion, dimension, grain size, soundness and freedom from slag. But to determine a workman's all-around ability, simple vee butt welds, pulled in tension, bent in a vise, sawed across and pickled in strong acid, are all that are necessary. These give a numerical rating to the welder. Mr. Loos also believes that important welds should be marked with a hammer stamp for identification, in order to spot the qualified but unconscientious workmen.

### *Important Studies on Pressure Vessels and Structural Steel*

TWO research committees are sponsoring important investigations. One, under the chairmanship of E. H. Ewertz, past president, is arranging to have constructed

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# Opposes Anti-Injunction Bill

## National Metal Trades Association Goes on Record Against Legislation to Curb Power of Federal Courts—Harold C. Smith, Illinois Tool Works, Chicago, Elected President

THE National Metal Trades Association at its thirtieth annual convention at the Hotel Astor, New York, April 25 and 26, went on record in opposition to anti-injunction legislation pending in Congress which would curb the power of the Federal courts in labor disputes. A bill introduced by Senator Shipstead of Minnesota which would have this effect was attacked by speakers at the convention, and the resolutions committee was supported in its recommendation that the association go on record as follows:

> Be it resolved, that the National Metal Trades Association, in convention assembled, having confidence in the rights of the individual as constitutionally provided, and feeling that the present efforts to limit these rights and to restrict the functions of our Federal courts are not truly representative of American ideals, urges that the existing equity power of the Federal court should be continued.

### Attack Limiting of Protective Functions of Courts

Discussing the Shipstead and other similar legislation, President Paul T. Norton stated that this bill, if adopted, would limit the protective functions of equity courts to tangible property only. "In effect," he said, "it would remove the protection and a large part of the value of copyrights, patents and good will, and also the protection of the rights to employ or to be employed."

"As the law now stands," he went on, "members of the trade unions are adequately protected in their right to organize. Those who do not wish organization are protected in their right not to organize. The law does not forbid the expansion of legitimate business or intelligent management of the same. It does restrain such combinations as would restrict interstate trade or enter into forbidden practices by competition. Our association has taken an active part in developing a widespread opposition to the repeal of the anti-trust laws and similar legislation, and it is essential in the combatting of such measures that association members communicate with their legislative representatives."

### Oppose Reversal of Judicial Decisions

In an address on "The Significance of the Present Efforts to Change the Laws in Respect to Labor Combinations," Walter G. Merritt, counsel of the League for Industrial Rights, New York, pointed out that the present agitation for amending or passing new laws governing labor relations is aimed at a reversal of judicial decisions upon which the prosperity of our present industrial structure is founded. "The public as a whole," he said, "does not sympathize with this movement, and Great Britain has just paid dearly for her experimentation along the same lines."

Mr. Merritt favored the continuance of the anti-trust laws, stating that their repeal would likely lead to Government interference in business, thus destroying the basis of industrial liberty, founded on unrestrained competition.

Light was thrown on interference with business by the Government by Bernard J. Mullaney, vice-president Peoples Gas, Light & Coke Co., Chicago. He pointed out that the Government had engaged in many lines of business in direct competition with a large number of private enterprises throughout the country and that further expansion along these lines might seriously hinder the development of free competition and individual enterprise.

# Association Members Find Business Better

THAT business conditions in the metals industry are considerably better than they were six months ago, that in most cases they are just as good or better than was true one year ago, and that the upward trend will probably continue, were points brought out in the annual address of the president, Paul D. Norton. As has been customary in the past, a questionnaire on business conditions was sent to the entire association membership and the results tabulated in an effort to obtain an index of business activity.

Reporting on the present state of business, 37 members or 8½ per cent found conditions excellent; 173 or 39½ per cent, good; 186 or 42 per cent, fair, and 43 or 10 per cent, poor. "It is curious to note," Mr. Norton said, "that the same percentage of members reporting poor business last year reported poor business this year, while the number reporting conditions good or excellent increased by 2 per cent over last year."

In answer to the question, "How does business compare with six months ago?" 226 of 430 companies reply-

## *Harold C. Smith Named President*

*HAROLD C. Smith of the Illinois Tool Works, Chicago, was elected president, succeeding Paul T. Norton of the Case Crane & Kilbourne Jacobs Co., Columbus, Ohio. J. G. Benedict, Landis Machine Co., Waynesboro, Pa., was elected first vice-president and Jacob D. Cox, Jr., Cleveland Twist Drill Co., Cleveland, became second vice-president. J. W. O'Leary of Arthur J. O'Leary & Son Co., Chicago, continues as treasurer. Councilors for two years were named as follows: J. H. Van Alstyne, Otis Elevator Co., New York; H. C. Beaver, Rolls-Royce Co. of America, Inc., Springfield, Mass.; R. J. Russell, Century Electric Co., St. Louis; Theodore Trecker, Kearney & Trecker Corporation, Milwaukee; Paul T. Norton, Case Crane & Kilbourne Jacobs Co.*

*The growth of the association in its thirty years of existence has been steady, and it now has a membership of 1100 manufacturing plants employing about 1,000,000 metal workers. The increase in membership in the past ten years has been 35 per cent.*

ing reported an improvement, the average increase being 35.1 per cent. Conditions were found to be essentially the same by 122 companies, while 82 reported a decrease, the decline amounting to 24.8 per cent. Comparing conditions with one year ago, 181 companies reported improvement, 124 considered conditions about the same, and 122 noticed a decline. It was pointed out that the replies to these questions and a comparison with the replies made to a similar questionnaire last year indicate that there has been a material gain both in the amount of business transacted and in the number of shops enjoying favorable business.

### Upward Trend Expected to Continue

That conditions may be expected to improve during the year was brought out in the answers to the question, "What is the outlook for the next six months?" Of the 397 companies replying to this question, 25, or 6 per cent, reported the outlook excellent; 218, or 52.4 per cent, good; 136, or 37.3 per cent, fair, and 18, or 4.3 per cent, poor.

Although 273 out of 427 companies reporting on the availability of labor had experienced no scarcity, lack of skilled machinists and specialists was noted by a number of companies. Fourteen companies reported a scarcity of highly skilled all-round mechanics, four reported a lack of highly skilled specialists, 88 lacked skilled machinists, 41 lacked skilled specialists and seven had difficulty in securing semi-skilled machinists, machine operators and specialists.

To overcome shortage of skilled labor, 281 companies stated that they were carrying on training activities ranging from the training of machinists only to the training of all classes of employees. Apprenticeship training activities were reported by 63 companies, while 24 mentioned foremanship training, although the question asked related specifically to shop labor.

## Are Industrial Profits Constantly Increasing?

THAT the average profits of established industrial enterprises have been gradually increasing over the last half-century was suggested by Dr. Charles J. Bullock, director Harvard Economic Society, Cambridge, Mass. Basing his deductions upon a wide investigation of corporate income tax returns, Doctor Bullock stated that he doubted the soundness of the rather frequent statement that 40 per cent of the industrial corporations in the United States are operating without profit, and that, on the other hand, he believed the rate of return on capital invested in industry at the present time is 4 or 5 per cent higher on the average than it was 50 years ago.

An investigation of companies that fail to report profits, he pointed out, usually reveals the fact that a number no longer exist and still remain on the income tax lists. Others are sales organizations for non-resident companies whose profits are included in the returns of the parent companies. In other cases profits are paid to partners and officers in the form of salaries.

### Six Per Cent Was a Good Return in 1880

Reviewing industrial evolution over the last quarter-century, Doctor Bullock stated that in the period following the Civil War and up until 1897, 6 per cent was a good average return on capital invested in standard lines of business that were forced to meet the full force of competition. Early in this period, inventory losses often absorbed profits for two or three succeeding years, but the average over a longer period was usually about 6 per cent.

In the period from 1898 until the beginning of the recent war, the speaker went on to explain, profits were somewhat higher, owing to a rising trend of commodity prices and to the gradual introduction of efficiency in business. The average return on capital invested in manufacturing staple lines in this period was slightly over 8 per cent. During those years modern accounting was introduced and other practices were begun which have had widespread use and benefits recently.

Eliminating the war period as a time of great abnormality in all lines of business, Doctor Bullock characterized the last five or six years as a period marked by the greatest industrial accomplishment the country has ever known. During this time, he placed the average profit at about 10.5 per cent. Thus, over a long period of years the profits of American industry have been tending upward, and in spite of the recent years of adjustment, the speaker felt the much talked of "profitless prosperity" is both non-existent and uneconomically improbable.

## Unemployment Exaggerated — Not Due to Mechanization

ESTIMATES made during the earlier part of this year of the number of unemployed were characterized as being "possibly interesting from the standpoint of theory but largely valueless and even detrimental to business as far as any practical purpose was concerned," in an address by Magnus W. Alexander, president National Industrial Conference Board, New York. "The widespread publication of some obviously exaggerated estimates," he declared, "have not helped to strengthen business confidence, and their deterrent effect on trade necessarily has not helped the general situation.

"A 'shrinkage' in employment," Mr. Alexander continued, "in only one or two fields of economic activity, like manufacturing and railroad transportation, over a period of two or more years in the past, which constitutes the basis for all estimates because it is the only related information available, is utterly irrelevant and inadequate for any calculation of the total number of unemployed at any given time. This is principally because it cannot account for employment in other fields of activity about which we have no data, but which include more than half of all those working for wages or salaries. While the number of workers required to turn out a certain amount of production has been relatively declining for years, there is also evidence that the number of workers engaged in distribution, trade and service has been constantly increasing, relatively and absolutely."

### Mechanization Allows for Readjustment

"The increasing use of labor-saving machinery in productive industry," the speaker declared, "may cause a temporary unemployment, but this so-called mechanization of industry is a relatively slow process, slow enough usually to allow for readjustment. Where temporary unemployment does ensue for some, the necessary readjustment may, and often will, cause temporary individual hardship. In its permanent and fundamental effect, however, progressive development in industry by way of mechanization has been, and is, a blessing in disguise in that it leads to an increase in our national prosperity, an increase of employment in new and correlative fields of industry, higher wages, lower living costs and higher standards of living as well as a greater margin for savings for the masses.

"If such unemployment as existed during the last winter had been largely technological in character, as is claimed by some—that is, if it had been largely due to the increased use of labor-saving machinery and power—then why did we hear practically nothing of unemployment in 1925, when from 1923 to 1925 there was not only a relative, but even an absolute shrinkage in employment in manufacturing and a great increase

in the mechanization of this industry? Mass production by a highly mechanized industry was widely hailed as a chief contributing factor to our national post-war prosperity, but suddenly was viewed by some as causing unemployment and hence was pronounced a menace to prosperity. Yet it is significant that this latter view was not voiced until after data had been published in 1927 showing that according to the 1925 census of manufactures a decline in manufacturing employment had taken place from 1923 to 1925."

**Employment Now Increasing**

"As far as manufacturing activity is concerned, developments since winter point toward increasing employment from now on, the decline in fact having come to a stop with the beginning of the present year. Since December, 1927, employment in manufacturing has been upward, and in February of this year was higher than at any time since July, 1927, and more than 3 per cent greater than in November, 1927, according to reports made to the National Industrial Conference Board, by about 2000 manufacturing establishments throughout the country employing about 1,000,000 persons.

"The Conference Board's index for total man-hours worked in manufacturing for February was 79.3 as against 77 in January, and the highest since last June, when it was 79.8. The average number of hours worked per week per wage earner has risen from 47.9 in January to 48 in February, the slight change in number of hours per worker reflecting the fact that the greater increase in total man-hours worked was due mostly to increase in employment. Average weekly earnings show a slight increasing tendency and in February of this year were at the same level as in February two years ago. Great stability is shown by the average hourly earnings per worker, which principally reflect wage rates paid and which during the two years February, 1926, to February, 1928, have fluctuated over a range of less than 3 per cent of those prevailing in February, 1926. This stability of average hourly earnings shows that such unemployment as has existed has not exerted any great pressure on wage rates, in contrast with the effect of unemployment in 1921 and at other times during the past.

"While these data do not throw any comprehensive light on employment in other occupations, such evidence as is available reveals an increasing tendency of employment in non-industrial fields, particularly in those created by the distribution and servicing of the products of new industries, like the automobile and radio industries. Changed living standards also are absorbing unusually large numbers into hotel and restaurant service. There has as yet been no evidence produced of anything more than a temporary, perhaps somewhat more than seasonal, amount of unemployment. The growing menace of so-called 'technological unemployment' which, it is said, is bound to grow with the mechanization of industry, is as yet an economic myth."

# Wage Incentives for Foremen Commended

WAGE incentives for foremen were comprehensively dealt with in two papers, one by H. W. De Bruin, works manager of the Jeffrey Mfg. Co., Columbus, Ohio, who has come up from the ranks, and the other by G. Heding of the Morkrum-Kleinschmidt Corporation, Chicago.

Mr. De Bruin said that in approaching the subject three viewpoints present themselves: 1. Opportunity for advancement; 2. Continuous employment; 3. An opportunity to share in the financial success of the company. Mr. De Bruin said that all of the foremen in the Jeffrey plant are developed from the ranks. Once a man has become a foreman an effort is made to make him feel that his work is important and that his efforts are appreciated; to obtain the best results the company encourages constructive thinking by its foremen and, after a certain preliminary training, it allows him unlimited authority in the conduct of his department. "Thus placing responsibility in your foreman," he said, "you will soon see a great change in him, in his department and in the men under him. He will look at his problem in a different light, and you will broaden his viewpoint and make him a better man for your company. He will be ready for advancement when the time comes."

"The foreman should be coached and trained so that he may realize that continuous employment depends upon the successful management of his duties," Mr. De Bruin said. "His alertness in improved methods of production and reductions in costs will enable the management to increase volume and insure continuous employment. In times of depression there should be some method whereby the foreman may be assured of steady work. This is management's problem and we should accept that responsibility and do our best."

**Foremen Should Share in Employer's Success**

As to wage incentives, Mr. De Bruin said: "We feel it is desirable and even necessary for the best interests of the company that those who are in position to make a direct contribution to the success of the business share in that success. Any plan of incentive should include those and only those items in which the individual may be expected to exercise some control. It is therefore not advisable to pay the foreman a bonus just because those under him are increasing production on account of some wage incentive. It is very difficult to base a foreman's bonus on tangible results, but unless this is done the results at best will be disappointing and will cause a great deal of dissatisfaction. To be effective, a bonus plan should give opportunity to increase earnings from 10 to 40 per cent. It should be figured and paid often enough so that the foreman will not forget it or lose interest in it. It should be understood that it is not a part of the basic wage, but is a special reward for actually achieving results. It should affect waste, increase in production, reduction in investment, reduce costs and foster cooperation between foreman and management. It should be so simple that the foreman can easily understand the results.

"It should be possible for the foreman to earn a bonus, even in the case of decreasing volume, if the efficiency of his department is increasing. It should be thoroughly understood that the bonus does not remove the possibility of an increase in the basic pay. Foremen should understand that their basic pay depends upon their value to the company reflected in the following: Ability and desire to work, willingness to cooperate, reduction in cost, elimination of waste, maintenance of quality.

**Foremen Training and Wage Incentive Go Hand in Hand**

"It has been said that the foreman is the spark plug of the industrial machine; if he is not working properly, the machine cannot run smoothly. It is certainly true that the foreman can make or break the spirit of the machine operator or the men under him more quickly than any one else in the organization. In fact, the whole policy of a concern toward its manufacturing force is largely interpreted or misinterpreted by its foremen.

"Reduction of the percentage of non-productive labor is not well known to the foreman, and, in fact, in some plants little attention is paid to it. Nevertheless, it has a tremendous bearing on the profits of the company.

"It requires considerable explanation and teaching to make the foremen realize what the non-productive labor is and how it can be controlled. The non-productive hours should be maintained in proper proportion to the productive hours at all times. When the foremen are properly trained and have the opportunity to share in the results of better management, they will

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# Foundry Congress at Barcelona

## High Spots of International Meeting, Which Included Exposition of Equipment and Products

*(Special Correspondence)*

THE International Congress of Foundrymen, the annual meeting of European foundry associations, was opened on the morning of April 11 at Barcelona, Spain, as was also the exposition of foundry equipment and products connected with it. The affair was a rather brilliant one, the Crown, the interested ministries, the Province of Catalonia, the city of Barcelona and the Spanish foundrymen being represented by their high dignitaries, some of whom appeared in uniform, brilliantly decorated with orders and attended by a military guard at attention flanking the speakers' platform. The hall was in the palace Victoria Eugenia, one of the buildings now being erected for the Barcelona Exposition in 1929, of superb construction on classic lines and for permanency. The exhibition, therefore, had an ideal housing.

The customary speeches of welcome were given by the hosts, with replies from the representatives of the foundry interests and associations of Great Britain, France, Germany, the United States, Italy, Czechoslovakia, Belgium and Holland. The session was then adjourned, and the exhibition was officially inspected. This, while not very large, nevertheless indicated the growing importance of the foundries of Spain, for many of its important plants displayed fine examples of their work for inspection and study.

Only a few molding machines, and these German, were in evidence. One exhibit attracted special attention in that a combination machine for sifting, tempering, pan-grinding and aerating floor sand for re-use was seen in operation. Among the many castings of automobile cylinders, steel castings for frogs and switches, malleable castings as good as we have them in the United States, and particularly arc castings of cast iron, bronze and aluminum, there were some sections of 2-in. cast iron spiral pipe for chemical purposes showing three convolutions, with about a 3-ft. diameter for the coil and some very good core work to give uniform thickness throughout.

The afternoon of the day was spent in visits to the Hispano-Suiza automobile works, inspecting its shops and foundries, and to the Government foundries for making castings for land and sea purposes.

The first business session convened on April 12, in the morning, and was taken up entirely in reading the following papers:

"Molding Sand Tests," by D. José Cañameras.
"The Cupola Heat Balance," by J. Ferrer Figueras.
"Determining the Humidity of Molding Sands by Their Electric Conductivity," by Dr. V. Ferer.
"Molding and Pouring a Locomotive Cylinder," by J. Salgado.
"Foundry Molding Sands," by G. Masson and H. Compere.
"Microscopic Study on the Influence of Phosphorus on Annealed Cast Iron," by Richard Bazant.
"Note on a New Test Piece for Cast Steel for Light Work," by G. Lely.
"Present-Day Cast Iron and Its Improvement," by Dr. Richard Moldenke.
"Nickel in Cast Iron," by Dr. Arthur Everest.

Most of these were discussed, some at great length. As a rule, the discussion drifted back to cupola practice and kindred shop subjects. About 250 members of the congress attended the meetings, the total registration exceeding 320 before the close of the week.

The second session, on the morning of April 13, took up the following papers:

"Three Communications Connected with the Study of Molding Sands," by Dr. V. Prever.
"Improving Our Methods for Diminishing the Cost of the Cupola Returns," by Leon Thomas.
"Study of Present-Day High-Test Cast Iron, and Furnace Control in Making It," by Dr. O. Langenohl.
"Production of Modern High-Test Cast Iron," by Amador G. Soto.
"The Revival of Cast Iron," by M. Jaime Coll.
"Test Pieces for Non-Ferrous Metals," by I. Sans Dernis.

In the afternoon, visits were made to the steel casting plant of La Compañía para la Fabricación de Contradores, where a 5-ton electric furnace heat of steel was poured into mine car wheels, and the heat treatment of manganese steel frogs and switches made in the establishment was observed. Afterward there was a visit to the Fábrika Sert, where gas meters are made in quantity.

In the evening there was a brilliant reception to the members of the congress and their ladies in the Palace of Deputies, the Governor of the Province of Catalonia receiving. This will be long remembered by those who attended, the great palace being of beautiful architectural design, with frescoes depicting historical occurrences, stately rooms with paneled walls and ceilings, and gold and color everywhere. The Governor, who is a Spanish grandee and the essence of courtliness, conducted the guests through all the chambers and gave a final collation. At noon there had been a special luncheon for the prominent visitors and foundrymen of Spain at the Ritz, which also proved a delightful function.

The third business session, and the closing of the congress, was enlivened during the reading of the second paper by a heavy detonation in the exhibition. A reservoir for compressed air had suddenly blown up and gone through the roof, smashing a large skylight. Fortunately no one was near and only one man was injured by the flying glass. It seems that this reservoir had been poorly welded and the whole bottom came off suddenly, the rest of the tank going straight upward. The following papers were read:

"The Control of Foundry Products," by Professor Portevin.
"Testing Cast Iron," by A. Plana.
"The Use of Cast Iron in Railroad Construction," by J. Manuel Lacleta.
"Study of the Relation of Tensile to Flexure Tests on Cast Iron," by J. Serrat Y Monastre.
"Observations on Iron Bars Embedded in Cast Iron," by Professor Dresden and D. Stoffel.
"Criticism of Methods for Determining Carbon in Iron Products," by Llamas del Toro.
"A Study of Foundry Technical Terminology," by J. M. España in collaboration with A. de Sequeria.
"A Laboratory for a Small Foundry," by F. Cuesta.
"The Fundamental Properties of Brass," by M. F. Ladreda.
"Proposed Classification of Analyses and Tests of Cast Iron," by M. Serrano.

The customary thanks and expressions of felicitations were interchanged, and the International Congress of Foundrymen then adjourned, London being the city selected for next year.

In the early afternoon the banquet was held, which proved another brilliant affair. Lieut. Col. Don César Serrano presided and the Governor was guest of honor. The speeches indicated the best of international feeling among foundrymen, and much may be expected from this annual interchange of technical foundry information. The following morning the party of 52 foundrymen and their ladies started on a tour through Spain to extend as far south as Seville.

# Placing Marketing Costs on Sound Basis

## Selling Does Not Receive Attention Given to Production—13-Month Calendar and Unemployment Also Considered at Management Meeting

THE costing of marketing activities, operation of the 13-month work calendar and the unemployment situation were among the topics considered at a meeting of the financial executives' division of the American Management Association, held at the Hotel Pennsylvania, New York, April 26 and 27.

Of particular interest was a discussion of the now widely used distribution methods in the manufacturing industries, which were characterized by J. P. Jordan, of Stevenson, Harrison & Jordan, New York, consultants on business problems, as being unnecessarily expensive, and, in most cases, lacking in the careful analysis and equitable proportioning of costs which are usually found in production activities.

### Marketing Functions Classified

In suggesting a sound method for the proper costing of marketing activities, Mr. Jordan stated that the principal functions should first be classified roughly into the following groups: Market research, or an investigation of where and in what volume goods may be sold; sales promotion or the use of demonstrations and other methods of interesting the public in a product; advertising and publicity; warehousing and shipping; statistical work; sales engineering or definite technical assistance in the use or consumption of a product, and direct selling activities in the various branches. The speaker pointed out that these classifications are not arbitrary, but may be generally adhered to in the marketing of any nationally consumed line of goods.

In costing these various functions Mr. Jordan declared that as many as possible should be charged directly to the branch office in which the activity is carried on and a complete profit and loss statement prepared for each district. As the result of this the direct cost of selling may be obtained and also the expenses of headquarters expended in market research, national advertising, etc., may be arrived at. Similarly the cost of sales made may be deduced and finally the unit cost of sale for each item. Further division may be made to indicate the cost of sales for each product and in this manner specialties and established staples may be classified as to cost of marketing.

It is usually necessary, the speaker went on to explain, to have a standard sales cost for each item, for, as is true in the steel industry, the cost of manufacture varies in different seasons of the year, depending upon the rate of operation. This enables the management to arrive at a definite trading margin below which no company should be willing to take orders even at the risk of losing business.

### Proportioning General Expense to Branches

Proportioning of general sales expenses to individual branch offices was characterized by the speaker as one of the most difficult problems in marketing and one of the reasons for allocating as much of the distribution expenses as possible directly to the branches. The general expenses, he said, cannot be prorated on the basis of sales, for one office may be selling very heavily and yet not be deriving as much benefit from national advertising, market research, etc., as another branch whose sales have become unusually light. National advertising, he pointed out, may usually be charged to the total volume of goods advertised. For expenses in general, Mr. Jordan expressed himself as in favor of prorating on the basis of orders, values and quantities sold, the allocation necessarily being adjusted to meet unusual conditions and figured on a definite basis without guesswork or estimating.

J. T. MacBain, Union Carbide & Carbon Corporation, New York, suggested a comparison of branch offices with the different departments in the plant and thus allocating expenses, but Mr. Jordan pointed out that plant departments are not called upon to meet competitive conditions and other problems which confront the distributing departments.

### What Is Accomplished

With the organization of marketing activities as outlined by Mr. Jordan, it is possible to obtain a monthly record of costs of sales offices and branches, a complete record of sales at each branch and gross profits by branches, the sales of each product and class of products, the cost per unit of branch selling expense, the ratio of all sales to branch office sales and the unit selling cost of each product. With the aid of these figures the management is able to allocate sales to individual office, to make use of a definite sales quota plan, to budget the various branch expense accounts, to compare the actual results of sales and expenses to quotas and budgets, to prepare charts showing compliance with quotas and budgets, to institute a fair and equitable bonus plan and to discover what lines are not profitable.

## *Results of* 13-*Month Work Period*

ADVANTAGES and disadvantages of the 13-month work calendar, as based upon the experience of some 40 companies now using the plan, were outlined in a report by M. B. Folsom, assistant to the chairman Eastman Kodak Co., Rochester, N. Y. As the result of a questionnaire sent to about 70 companies in the United States now using the 13-month calendar in one form or another, Mr. Folsom learned that two companies had been using the simplified calendar for 30 years or more. Ten introduced it in the period from 1911 to 1916; 12, during the next five years, and 15 after 1922. The extra day at the end of the year is sometimes inserted at the end of each thirteenth period, while some companies find it more convenient to add an extra week to the last period every six years. Nearly all the companies using the plan base all their internal records upon it, but in most cases statements to the trade are sent upon the customary dates in the old calendar and accounts payable are paid in the same way. Many companies, however, have made arrangements with banks, vendors and companies supplying light, power, etc., to render statements upon the desired dates in the new calendar. Books are usually closed at the end of the periods, this having led to one disadvantage on account of the unevenness of quarters. To eliminate this inconvenience, a few companies have discarded the practice of quarterly closings, and others have been able to secure all desired results by the use of cumulative closings for comparative purposes.

### Advantages and Disadvantages

A large percentage of the companies replying to Mr. Folsom's questionnaire reported little or no difficulty in introducing the new calendar, and listed its principal advantages as the facilitating of comparisons of business, plant operations, etc.; elimination of split payrolls; assistance in budgeting; ending of month at end of week; fixed number of days in month and flexibility of accounts.

The disadvantages of the system, most of which arise on account of the use of two different calendars at the same time, would be largely eliminated by the general adoption of the calendar, according to Mr. Folsom, and also to a consensus of opinion of the companies now using the 13-month plan.

Representatives of several companies operating 13-month work calendars told of their experiences with

the introduction and use of the new system and all reported complete satisfaction. L. J. Stewart, comptroller Western Clock Co., LaSalle, Ill., stated that his company had used the simplified calendar for more than 30 years and mentioned most of the advantages listed above as having been derived from its use.

Paul H. Wilson, secretary Graton & Knight Co., Worcester, Mass., said that his company had introduced the 13-month calendar simultaneously with a new accounting system in 1918 and that the results had been very satisfactory. He pointed out that a few inconveniences were met in the first year or two on account of the difficulty of making comparisons with the previous years, but that such disadvantages were automatically overcome as the plan continued in use.

#### World-Wide Movement to Introduce New Calendar

At the close of the session the plans now under way to secure world-wide adoption of the 13-month calendar were outlined. It was pointed out that the League of Nations at a recent meeting had asked all the Governments of the world to appoint committees to obtain the trend of public opinion in the various countries regarding calendar revision. After the results of the work of these committees have been accumulated a World Congress will be called to compare results, and if favorable to the new plan, to arrange for its universal adoption. It was predicted by some exponents of the revised calendar that present progress indicates its general adoption on Jan. 1, 1933.

## *Unemployment Analyzed*

AN analysis of the present unemployment situation by Dr. H. W. Moorhouse, president Brookmire Economic Service, Inc., New York, was the feature of the luncheon meeting on Friday. Dr. Moorhouse estimated the number of persons unemployed through lack of economic activity as of March, 1928, at 2,632,000. Although this figure is considerably higher than the 1,466,000 of unemployed which he estimated for 1927, it is considerably below the 3,653,000 who were forced into idleness in 1921. He saw no immediate economic danger in the situation and stated that conditions had probably improved somewhat since March, when the last estimate was available.

Dr. Moorhouse derived the above figures by assuming a number of years over a period of the last 19 as periods of full employment owing to the high level of business activity. These years were 1910, 1912, 1917, 1920, 1923 and 1926. The percentage of total population employed was computed for these years and percentages for intervening years interpolated on a straight line and used for computing full employment for intervening years. Actual employment for each year was computed from data taken from a number of official and unofficial sources, and according to the speaker, enough actual figures were obtained to secure a definite index of activity. Unemployment was taken as the difference between the probable maximum employment and actual employment during the year. It does not allow for numbers idle during years of exceptionally high business activity.

#### Adjustment Is Principal Cause

Dr. Moorhouse pointed out that, although it is true that a certain number of workers were annually thrown out of employment on account of the so-called mechanization of industry, economic adjustment invariably followed which enabled these persons to find a livelihood in other lines of work. The fact that this adjustment usually followed slightly behind the actual mechanical progress of industry, he declared, would account for a certain normal unemployment, an average of 874,000, or 2 per cent, as computed over a 19-year period. A more basic reason, however, for such periods of unemployment as we are now passing through is the business cycle, and so long as the business cycle exists the number of unemployed will fluctuate with it.

Although it is possible to alleviate unemployment to a slight extent by stimulating activity on public works and other projects, Dr. Moorhouse stated that he did not believe this would ever lead to any definite solution of the problem. When appropriations have been made and plans prepared it will be impossible to await a period of unemployment before undertaking a project and likewise work of this sort cannot be created indefinitely at such times.

## ORES BECOMING LEANER

### Iron Content in 1927 at Lowest Point in 10 Years; Moisture Was High

LAKE SUPERIOR ore decreased in average iron content over 0.5 per cent last year, being 51.19 per cent iron, natural, as compared with 51.75 per cent in 1927. This is the lowest in the past 10 years, as shown in an annual report of the Lake Superior Iron Ore Association, containing tables of ore analyses of all grades and for all ranges and including also the content of phosphorus, silica, manganese and moisture. The highest iron content in the 10-year period was 52.07 per cent, in 1921, which was a very poor tonnage year and during which shipments were more generally confined to the richer grades of ore.

The moisture content increased last year to 11.31 per cent from 10.78 per cent in 1926, and with the exception of 1919 was the largest in the 10-year period. This may have been in part due to the fact that less ore was washed last year than during the preceding year, the percentage of moisture being less in washed than in unwashed ore.

While the percentage of silicious ore was virtually the same as during the previous year, more silicious ore running high in silica was shipped last year than in 1926. The iron content of silicious ore dropped 2.50 per cent to 37.29 per cent, and the silicon content of this ore increased nearly 5 per cent, or from 33.58 per cent to 38.35 per cent. This evidently explains an increase of 0.25 per cent to 8.60 per cent in the average silicon content of all ores. The phosphorus content increased from 0.101 per cent to 0.105 per cent and manganese from 0.80 per cent to 0.84 per cent.

Bessemer ore last year had an average iron content of 54.67 per cent, compared with 55.16 per cent in 1926. Low-phosphorus non-Bessemer ore, comprising over 61 per cent of the total ore shipped, declined in iron content from 51.39 per cent in 1926 to 51.03 per cent last year. In the Mesabi district low-phosphorus non-Bessemer decreased in iron content from 50.94 per cent to 50.40 per cent. High phosphorus non-Bessemer decreased from 51.11 per cent to 50.86 per cent. Manganese ore was the only grade to show a gain in iron content, increasing from 42.64 per cent in 1926 to 42.81 per cent last year.

Taking the ore by ranges, the iron content of that mined on the Mesabi range was 51.47 per cent last year, compared with 52.16 per cent in 1926. On the Gogebic range there was a decline from 52.97 per cent to 52.30 per cent, on the Marquette range a decrease from 50.07 per cent to 49.40 per cent, and on the Cuyuna range from 43.53 per cent to 43.05 per cent. The Menominee range showed an increase from 50.30 per cent to 50.52 per cent, and the Vermilion range an increase of from 58.22 per cent to 58.47 per cent.

## Commercial Aviation in the United States

Express and passenger air routes in the United States are placed at 7265 miles in a statement prepared by David Gregg, research engineer AC Sparkplug Co., Flint, Mich. Mail routes measure 7763 miles, and the total length of commercial air routes is 12,627 miles. On these routes 3264 planes are operating, with 3584 pilots licensed. Last year 2011 new commercial planes and 365 military and naval planes were built, a gain of 98.4 per cent over the 1926 output. The largest production by any company was 454 units.

By June 30 air mail planes will be flying 25,000 miles daily. With 80 station stops, these planes will be serving trade areas which include a population of over 62,000,000 persons.

# Electrochemists Hold Spring Meeting

## Electric Annealing and Melting of Non-Ferrous Products Reviewed—Refractories for Electric Brass Furnaces —New Officers

WITH a registered attendance of about 275 members and guests, the fifty-third meeting of the American Electrochemical Society at the Stratfield Hotel, Bridgeport, Conn., last week, April 26, 27 and 28, was one of the largest the society has held. A variety of subjects, covered by the presentation and discussion of over 30 papers, attracted electrochemists and metallurgists from many industries and localities. One day's sessions were devoted to industrial electric heating, another to a symposium on the chemical production of electricity, at which 18 papers covered the technical and theoretical problems of batteries of all kinds, and a third to the electrodeposition of metals. Besides these there was a round table luncheon on "Refractories for Electric Brass Melting."

### Electric Annealing of Non-Ferrous Products

The session on industrial electric heating was held jointly with the National Electric Light Association. Unfortunately there were only two papers in this field finally offered at this session, others originally provided for not being available. The two papers presented dealt with recent important developments in the non-ferrous industry—one the electric annealing of non-ferrous metals and the other, the melting of nickel-silver in high-frequency furnaces.

Taking as his subject "Annealing of Non-Ferrous Metals in the Electric Furnace," Robert M. Keeney, industrial heating engineer Connecticut Light & Power Co., Waterbury, Conn., presented a picture of the latest developments in this field, particularly in Connecticut, where the manufacture of non-ferrous products is a leading industry. For annealing such products the author stated that there are now 27 electric furnaces and annealing machines in that State with an installed capacity of 5865 kw., distributed among 15 plants. These furnaces are used for the annealing of brass condenser tubes, seamless brass tubing, brass shells, brass eyelets, aluminum tubing, nickel-silver stampings and for the bright annealing of copper tubing.

Little progress has been made, says Mr. Keeney, in the application of electric heating to the breaking-down operations of the brass rolling mill, but it is proceeding rapidly on the lighter products which require more finishing. For this class of work the electric furnace has proved more economical than oil or gas, in many cases resulting in an annual return of 50 per cent on the investment. The failure to apply them in rolling mills is due, says the author, to failure to consider economies in over-all cost which electric annealing may produce.

The author discusses the various types of furnaces suited to brass, copper and nickel-silver products. For annealing brass tubing two methods are used: Passing an electric current through it, an adaptation of the Snead machine, and the use of the muffle furnace. For bright annealing of copper tubing the electric water-sealed furnace has proved satisfactory.

### Discussion

Discussing this paper, E. W. Beardsley, furnace engineer American Brass Co., Waterbury, Conn., said: "The question is asked, why have no Connecticut manufacturers installed electric furnaces for the rolling and drawing of brass, copper and nickel-silver into sheets, heavy tubing and wire? It is suggested that the answer lies in a failure to investigate the advantages to be gained. This seems to be a common belief among electric furnace salesmen and other engineers who are not acquainted with the manufacturers' conditions. Connecticut manufacturers have installed electric furnaces for the annealing of non-ferrous products other than small tubing. There are various reasons why they have not gone further in that direction. To begin with, I know of no such manufacturer who can buy electric energy for 1c. per kwhr., including demand charges.

"Mention is made of the economy of the recuperative type of furnace. In one case, careful consideration of such a furnace developed the fact that, out of six plants where, theoretically, it might be profitably used, there were only two locations in which it would be a physical possibility to install a furnace of such length, without prohibitive expense in changing existing equipment. Another drawback to the general adoption of the recuperative type of furnace in brass mills, as well as some other seemingly valuable devices, is the mistaken idea regarding the value of an automatically maintained uniform furnace temperature. A steel mill runs all day, commonly, on a product of uniform character requiring a uniform heat treatment. In a brass mill the character of the work varies greatly in the course of a day. One lot requires a certain temperature. The following lot may require 100 deg., or more, above or below that.

"The accurate control or determination of temperature in the electric furnace is of great advantage for some of the most rigid requirements in the finished product and the saving of rejected output. The duplicating of savings made elsewhere is dependent upon a comparison of the previous practices as well as other factors. Failure to install electric annealing furnaces may, therefore, be due in no small measure to the fact of careful overall consideration rather than to lack of it."

In reply, Mr. Keeney said that the small user cannot get 1c. power, but the large one can so adjust his power consumption as to obtain power at that price on his furnace. While it is true that the recuperative furnace is hard to adapt in brass rolling mills, there are other simpler ones which can be used. It is always best to consult the power company before installing any furnace.

### High-Frequency Melting of Sterling Silver

Operating data obtained from melting sterling silver in Ajax-Northrup high-frequency furnaces at the plant of the Handy & Harman Co., Bridgeport, are given in a paper, "Melting Sterling Silver in High-Frequency Furnaces," by Robert H. Leach, manager of research and development of that company. The performance of both the oscillator and motor generator types is discussed, as well as the relative efficiency of the air-cooled and water-cooled coil when used with the generator type. Costs, as compared with the operation of oil-fired furnaces, are also summarized. These are said to compare favorably with the type of oil-fired furnaces previously used, with the principal advantages as follows: Accurate control of temperature and uniform heating, prevention of metal losses, reduction in the amount of metal absorbed in the furnace, and improved working conditions.

Answering a question as to whether there is not in such furnaces considerable churning of the hot metal so as to cause absorption of gases, Mr. Leach said that there is churning in the motor generator types, but the metal made in these stands the very highest tests.

Over 80 sat down at a round table luncheon Friday, April 27, presided over by Dr. B. D. Saklatwalla, vice-president Vanadium Corporation of America. A very interesting discussion on "Refractories for Electric Brass Furnace" followed. Representatives of many of

the electric furnace builders and users were present, as well as producers of refractories and electrodes.

These round table discussions, which originated with the society, are regarded as occasions on which anyone can speak his mind freely without being quoted. Many phases of this important problem were brought up. It is apparent that a satisfactory solution has not yet been reached and that there is much room for improvement in finding a refractory suitable as to life and efficiency, particularly for copper and red brass melting furnaces.

*Paul J. Kruesi, Elected President of the American Electrochemical Society for 1928-1929, Is President of the Southern Ferro Alloys Co., Chattanooga, Tenn.*

The relative merits of various refractories were freely discussed, such as fused magnesite and carborundum, and considerable difference of opinion was expressed. The question as to whether a lining should be put in a furnace by ramming in the refractory or by the use of blocks of material suitably cemented together took up considerable time. There were arguments for and against both. There was considerable free discussion of new refractory materials. The interchange of opinion on the life of refractories developed from the experience of users was illuminating.

**New Officers**

At the annual business meeting, the following officers were announced as elected:

*President for one year:* Paul J. Kruesi, president Southern Ferro Alloys Co., Chattanooga, Tenn.

*Secretary for one year:* Dr. Colin G. Fink, Columbia University.

*Treasurer for one year:* Acheson Smith, Acheson Graphite Co., Niagara Falls, N. Y.

*Vice-presidents for three years:* Dr. F. C. Frary, director of research Aluminum Co. of America, New Kensington, Pa.; F. N. Speller, metallurgical engineer National Tube Co., Pittsburgh; Dr. Alfred Stansfield, professor of metallurgy McGill University, Montreal, Canada.

*Managers for three years:* Dr. F. M. Becket, vice-president Union Carbide & Carbon Co., New York; L. E. Saunders, manager abrasive plants, Norton Co., Worcester, Mass.; S. Skowronski, research chemist Raritan Copper Works, Perth Amboy, N. J.

It was announced that the late Dr. Carl Hering of Philadelphia, one of the founders of the society, left it a substantial sum of money, the amount not to be known for a year or so.

**Future Conventions**

The fall convention is to be held at Charleston, W. Va., Sept. 20, 21 and 22. The "Chemistry and Metallurgy of Nickel" will be the subject of one symposium, and there will be a group of papers on "Chemical Reactions at 1000 Deg. C. and Above."

It was decided by the board of directors that the spring meeting next year, upon invitation by the University of Toronto, will be held at Toronto, Canada, May 27, 28 and 29.

**Plant Visitations**

Several plants threw open their doors to those attending the convention. Among these were: Bridgeport Brass Co.; General Electric Co.; Remington Arms Co.; Holmes & Edwards Silver Co.; American Tube & Stamping Co.; Handy & Harman, and Connecticut Light & Power Co.

## Japanese Railroads Buy 60,000 Tons of Rails from Domestic Mill

WASHINGTON, April 30.—An order for 60,000 tons of 100-lb. rails has been placed by the Japanese Imperial Government Railways with the Yawata Steel Works, covering requirements for the coming half year in connection with a rail replacement program, according to a report received by the Department of Commerce from Tokio. The rails will be laid on the electrified portion of the government railroads, some parts of the Tokaido line and a portion of the Sanyo line.

In addition to the replacement of 75-lb. rails with 100-lb. rails, 65-lb. rails will be replaced with 75-lb. rails. The use of light rails and a narrow gage have always seriously restricted speed and carrying capacity, the report says, and in some quarters this replacement is considered as preliminary to a general movement for widening gages, although this would require an extensive relocation of many parts of the main lines.

## Steel Plants Have Larger Forces and Bigger Payrolls

WASHINGTON, April 28.—Employment in iron and steel plants increased 1.9 per cent and the payroll 2.1 per cent in March when compared with February, according to the Bureau of Labor Statistics, Department of Labor. The number of employees in 200 plants was 262,853 in March, against 258,060 in February, while the respective weekly payrolls were $8,394,777 and $8,225,173. Employment in the machine tool industry increased 2.2 per cent in March; in cast iron pipe foundries, 3.7 per cent, and in plants making foundry and machine shop products, 1.6 per cent.

When compared with March of last year employment in iron and steel plants showed a decline of 6.3 per cent, while the decrease in the payroll was 5.8 per cent. Cast iron pipe plants showed declines of 13.9 and 14.9 per cent; machine tools, 6.3 and 0.9 per cent; foundry and machine shop products, 9.7 and 10.7 per cent.

Employment in manufacturing industries in general increased 0.7 per cent in March when compared with February, and payroll totals increased 1.3 per cent. Employment in March stood at a higher level than at any time since October, 1927, while payroll totals were greater than at any time since June, 1927, with the single exception of October, when they were the same as in March. The bureau's weighted index of employment for March was 86.1 per cent.

## New Continuous Sheet Mill Projected in Germany

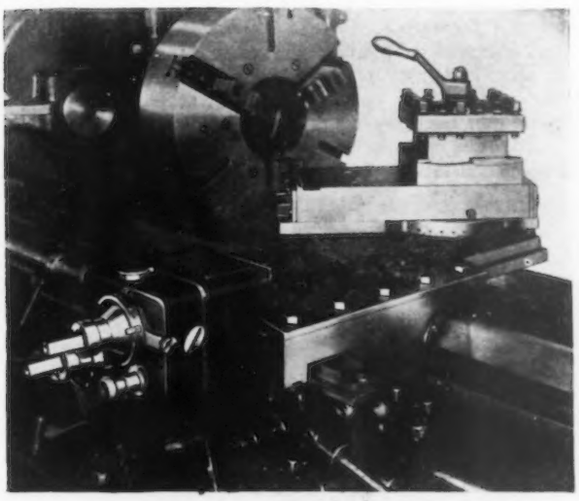
HAMBURG, GERMANY, April 15.—Since the return of engineers who visited steel mills in the United States, the Hoesch Steel Works, Dortmund, is understood to be preparing to introduce the continuous rolling of sheets. This will be the second mill in Germany to produce sheets by the continuous method. The United Steel Works is operating a small mill on an experimental basis, with the intention of increasing capacity in the near future.

The Hoesch works has started the construction of a large cold-rolling mill at Stockheide, where a new development will be utilized. Thin-gage sheets, it is understood, will be electroplated with aluminum at a low cost and offered in competition with tin plate. It is believed that the price will be below that on tin plate. Patents for this process are controlled by the Wickeder Eisen und Stahlwerke, a subsidiary of the Hoesch works, and the plant is being constructed by the Grusonwerke, a subsidiary of the Friedrich Krupp A. G. at Essen.

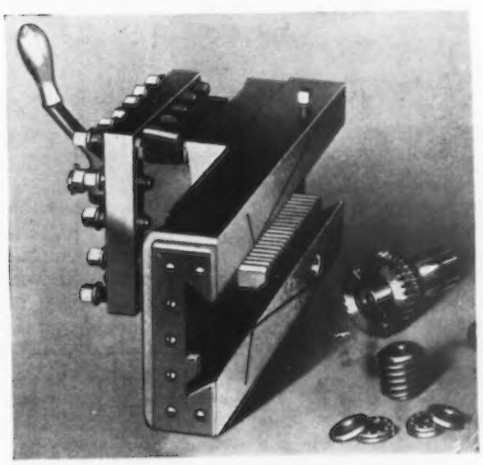
## COMPOUND CROSS-SLIDE

### Device for Warner & Swasey Lathes Permits Steep-Angle and General-Purpose Work

FOR turning bevel gear blanks and other parts having steep tapers, as well as for heavy-duty general purpose work, the Warner & Swasey Co., Cleveland, has brought out the new compound cross-slide shown in the accompanying illustrations. The device can be



*The Full Stroke and Swing Capacity of the Lathe Is Not Affected by the Compound Slide. Arrangement of the bottom of the slide may be noted from the view below*



furnished for the company's new Nos. 3-A and 4-A turret lathes.

In addition to strength and rigidity for angle and heavy general purpose work the device is designed so that the full stroke and swing capacity of the turret lathe is not affected by the compound attachment. Other features include ease of operation and quick setting to any angle; powerful feed mechanism; wide range of operation; and thorough lubrication.

The compound cross-slide is of massive construction. The square turret, which carries the cutters, is made from a solid forging. The company's patented lock bolt is used so that it is not necessary to lift the turret from its seat for indexing. A swivel plate, made from a steel casting, is held securely to its base by four bolts in order to give maximum rigidity for the heaviest cuts and forming when used either as a compound or for regular straight cutting work. The cross-slide is held to its base by a square lock construction and to this is attributed unusual rigidity of the cross-slide, swivel plate and square turret, even when the slide has traveled to the extreme end of its stroke and somewhat overhangs the base.

The new cross-slide may be used as a straight turning and facing slide, as well as a compound slide, and is securely held and locked in place by four bolts, two on either side of the slide. By locating the four binding nuts underneath the swivel base rather than above, the graduated dial on the compound base has been made narrower than usual, thus minimizing overhang of the cutters and preventing interference with the chuck jaws. Angles can be faced or turned up to the full swing capacity of the Nos. 3-A and 4-A turret lathes and the swivel plate can be rotated through 360 deg., the full swing stroke of the slide being 8 in. It is also possible to use the standard taper attachment with this compound cross slide.

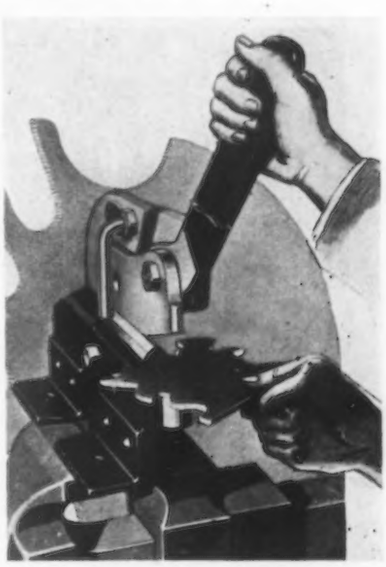
Both the cross and compound slides have power feed, and the arrangement is such that it is impossible to engage both of these at the same time. Graduated dials are large and are proportioned to assure quick and accurate setting of the clips. The power feed knock-off is operated in the same manner as that on the company's standard cross-slide. The feed mechanism is of the worm and worm gear type, the worm gear being of large proportions and mounted directly on a hardened and ground feed pinion shaft, which has a bearing both above and below the worm gear. Ball thrust bearings mounted on both sides of the feed worm are submerged in a bath of oil. It is pointed out that with the rack and pinion construction it is possible for the pinion to run entirely off its rack at either end of its stroke, thus providing a safety feature.

A large hinged oil cup at the front of the cross-slide provides a central oiling station. A wick, feeding from an oil well, lubricates the pinion feed shaft, the worm and worm gear running in a bath of oil. Wipers are used to protect the dovetail beneath the compound from grit and dirt.

Forming cuts 1/32 in. deep, cutting a chip ½ in. wide in 30 carbon steel, are said to have been taken over an extended period and under actual operating conditions without any signs of wear in the feed mechanism.

## Hand-Operated Shear and Nibbler

A hand-operated slitting shear and nibbler for use in pattern shops and tool rooms, in making templets and gages, has been placed on the market by the National Machine Tool Co., Racine, Wis. The capacity of the shear and nibbler is for ⅛-in. flat stock. Provision is also made for rod cutting, the capacity of the rod cutter being for material up to 5/16 in. in diameter.



*The Capacity Is for Shearing or Nibbling Flat Stock ⅛ In. and Less in Thickness. Rods Up to 5/16 in. may also be cut*

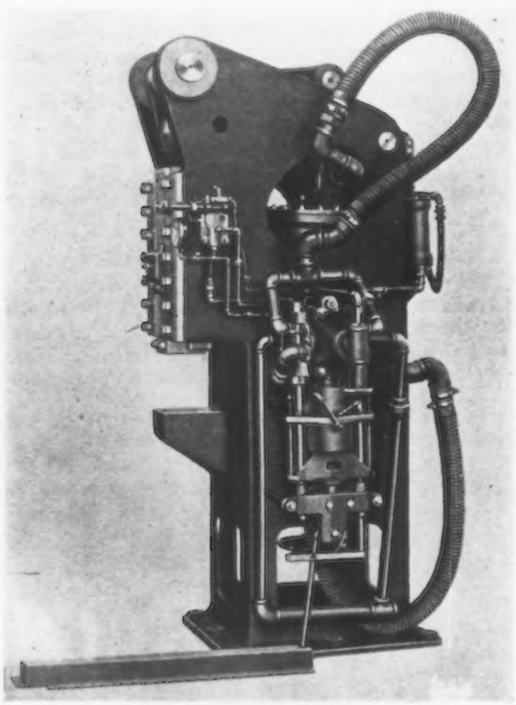
The machine may be mounted in a vise or on a bench. The clamping device consists of a taper latch which will adjust itself to the vise and which may be swung out of the way when bench mounting is desired. Shear blades are of tool steel and are arranged for convenient removal for sharpening. Special blades for cutting intricate shapes are obtainable, and extra upper and lower shear blades and die bushings of standard design can be furnished. The weight of the machine is 13 lb.

## High-Speed Pneumatic Press for Coining, Punching and Other Operations

A high-speed pneumatic press for coining, squeezing, forming, upsetting, shallow-drawing, extrusion and punching operations has been made available by the Hanna Engineering Works, 1765 Elston Avenue, Chicago.

The arrangement of the machine may be noted from the accompanying illustration. An air cylinder piston unit actuates the ram through a toggle and lever mechanism such as employed on the company's compression riveters. The toggles are designed to close the gap between the dies with little air consumption, while the lever exerts uniform tonnage on the dies through a considerable portion of ram strokes regardless of variation in thickness of work. The stroke of the die or ram may be set for a wide range of lengths by adjusting a handwheel at the base of press and the pressure exerted between dies may be set for any amount from 20 per cent of the full press rating by adjusting a pilot valve regulating spring. The pressure for which the machine is set is indicated directly on a gage which is visible to the operator at all times.

High speed of 30 to 40 cycles a minute is attributed to a number of features, including the use of shock absorbing cushions at both extremes of piston stroke, air counterbalance and automatic reverse from down stroke to up stroke. The foot trip pedal for starting each stroke cycle requires movement of only 1 in. of the operator's heel, who, in operating the machine, stands naturally with his weight on both feet. The



*From 30 to 40 Stroke Cycles Per Min. Are Obtainable. The pressure for which the machine is set may be read from a gage*

machine is arranged so that only one die stroke cycle will result from each depression of foot trip pedal, even if the pedal is held down. The pedal is guarded against accidental depression. An adjustment is provided to simplify die setting and eliminate shims less than ¼ in. thick. This adjustment, together with the stroke adjustment, is emphasized as minimizing air consumption. The return stroke is accomplished at less than one-tenth the air consumption of full tonnage working stroke. The press illustrated is rated as exerting 150 tons between the dies, at 100 lb. air pressure.

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The eighteenth annual May lecture to the Institute of Metals (London), will be delivered by Prof. Cecil H. Desch on "The Chemical Properties of Crystals" at the Institution of Mechanical Engineers, Westminster, S.W.1, London, on Tuesday, May 8.

## Two-Speed Single-Cylinder Surfacer for Work Up to 24-In. Wide

A general utility single-cylinder surfacer with a capacity for stock up to 24 in. wide and 8 in. thick has been added to the line of the J. A. Fay & Egan Co., Cincinnati. The machine, designated as the Safety Sealed No. 560, features full electric drive, ball bearings and the arrangement for two-speed operation.

The frame is a one-piece "safety sealed" cabinet with lines free from recesses which accumulate dirt. It incloses all the feed driving parts and removable plates are provided so that gears and working parts may be accessible. Covers are also furnished to prevent entrance of shavings into the raising screw gears or accumulating in lower part of frame. The table, also a one-piece casting, is accurately fitted in the frame and has long ways with gibs for taking up wear.

The feed consists of four rolls, all driven. The upper feed-in roll is fluted. The drive is from the cylinder by

*Two-Speed Gear Shift, Push Button Start and Stop, and Use of Ball Bearings Are Features*

means of combination wedge contact link belt, through cut steel gears having true rolling contact. Pressure is maintained by automatic graduated spring levers. Pressure bars are provided before and after the cylinder, acting close to the cutters, and with the close centers of the rolls enable the producing of smooth work on short stock. For feeding a number of pieces, varying up to ⅛ in. in thickness, through the machine at one time, a flexible sectional feed roll and sectional chipbreaker are available. Two rates of feed, 18 and 30 ft. per min., are obtained by means of hardened sliding clutch gears, feed changes being made by a lever at the front of the column.

For motor drive, a 5-hp. 3600-r.p.m. motor is employed. The machine can also be arranged for belt drive. The floor space occupied is 44 x 65 in.

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## Switch Throws Motors Across the Line

A new magnetic switch, suitable for throwing squirrel-cage motors directly across the line, or for use as a primary switch for a wound-rotor motor the secondary of which is handled by a drum controller, has been introduced by the General Electric Co. It consists of a triple-pole, restricted-blowout type, magnetically-operated contactor, with normally open interlock, and two hand-reset, temperature overload relays, all mounted on a molded base and inclosed in a drawn-shell, steel case. It is designed for use on standard voltages and frequencies. Maximum ratings are from 50 hp. on three-wire 220-volt circuits to 125 hp. at 550 or 600 volts.

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The Hanna Furnace Co., Cleveland, has placed a contract with the W. B. Pollock Co., Youngstown, Ohio, for the rebuilding of one of its Buffalo blast furnaces, including the construction of a new furnace stack.

# SMALL JIG BORER

## Simplicity of Operation and Wide Range Are Features of Precision Machine

SAVINGS in cost of making jigs and in general precision boring are claimed for the small jig borer here illustrated, which is being marketed by the Pratt & Whitney Co., Hartford. The machine, which is designated as the No. 1 or No. 1A, according to its capacity, is of the same fundamental principle as the company's No. 2 jig borer, previously announced, but is of new design throughout.

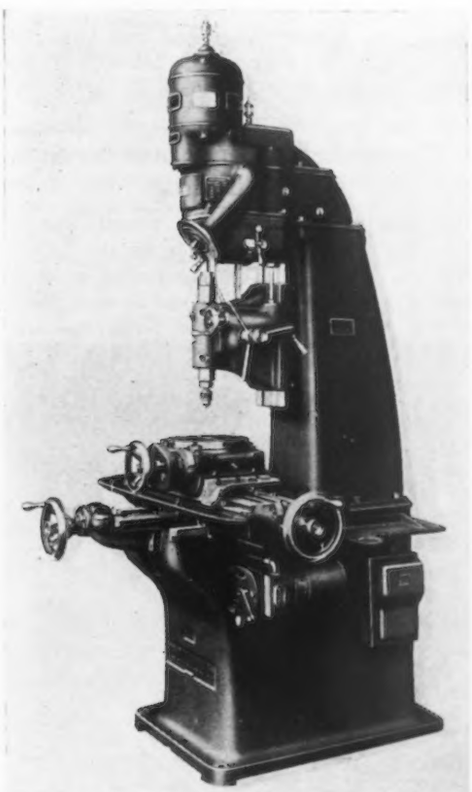
Like the larger machine the new jig borer is in effect a combination of a precision vertical boring mill of single-column type and an accurately built measuring machine for locating the work. The single column construction is emphasized as providing the necessary rigidity for precision boring and at the same time giving full accessibility for setting up without interfering with the light on the work.

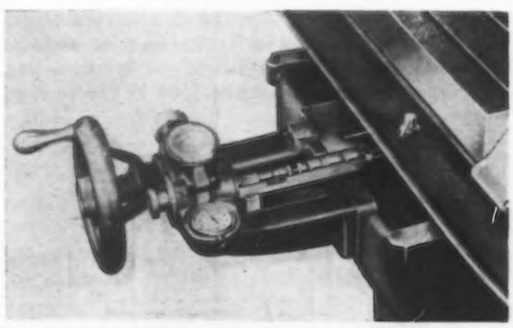
The No. 1 and the No. 1A machines are identical except for the difference in the distance between the table surface and the spindle nose, which is 4½ in. greater in the No. 1A machine. A vertical variable-speed motor, built into the machine at the top of the column, is arranged to drive the spindle either directly or through sliding back gears. Shifting from one speed range to the other may be simply accomplished. The shifting lever has a circular motion and operates a spiral cam which engages and disengages the clutches which, in turn, connect the back gears or the direct drive. A complete turn of this lever makes the change from low to high speed or vice versa without stopping the motor. The four motor speeds and the back gears give a total of eight spindle speeds ranging from 132 to 1800 r.p.m., which adapts the machine for drilling and reaming as well as boring.

The spindle quill construction is used, the quill being carried in a heavy spindle head. The spindle head is mounted on a single slide with broad bearing surfaces and with a gibbed narrow guide to maintain accurate vertical alinement. It is balanced by means of counterweights inside the column and is moved vertically by rack and pinion operated by the large handwheel on the side of the head. Binder bolts on either side provide for locking the head in position.

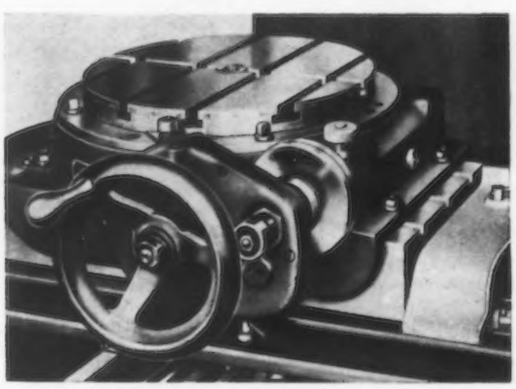
There is a double worm and clutch device by means of which power feed to the spindle quill, either up or down, is available. A large spoked handwheel at the right-hand side of the head operates a rack and pinion hand rapid traverse to the spindle quill. The round knob at the center of this handwheel serves to engage either one or the other of the two worms giving the up or the down power feed, and also provides a neutral position. A small handwheel on the front of the head is used for slow motion hand feeding of the spindle quill. Power for the quill feed, taken from the motor that drives the spindle, is transmitted through back gears which provide for two power feeds of 0.002 and 0.005 in. per spindle revolution. These back gears are engaged by a small lever on the side of the column and can be shifted while the machine is in motion.

The spindle is mounted in large bronze bearings inside the quill and has a ball thrust bearing at its lower end. The quill has a 4 in. travel in addition to the travel of the spindle head on the column face. This permits the boring of the deepest holes for which the machine is designed without the necessity of resetting the head. Graduations on the face of the quill permit boring to a definite depth. The spindle nose is recessed for collets and is threaded for a collet closing ring.





The No. 1A Jig Borer Is at Left. A close-up view of the indexing circular table is below, and detailed view of one of the measuring slides, as the operator sees it, is above.



The measuring instruments and the general arrangement of the work table and slides is the same as in the company's larger jig borer. The work table is traversed in two directions by screws operated by handwheels, and each slide is equipped with a complete measuring device. Slow motion is provided for close positioning. The traversing screws have no connection with the measuring instruments, and errors in the screws, wear or backlash do not affect the accuracy of positioning. The measuring device consists of end measures for even inches, an inside micrometer for fractions of an inch and a ten thousandth dial indicator for determining the final exact accuracy. There is a small adjustable slide attached to the table through a binder which determines the zero position for any one job. With this zero position determined and registered on the dial indicator the table can be moved any desired amount and located exactly by means of the end measures and inside micrometers. The dial indicators show the position of the table relative to the zero position and indicate instantly any minute change that may occur in the location of the table. Thus they form a continual check on the accuracy of the job.

In addition to simplicity and its being readily un-

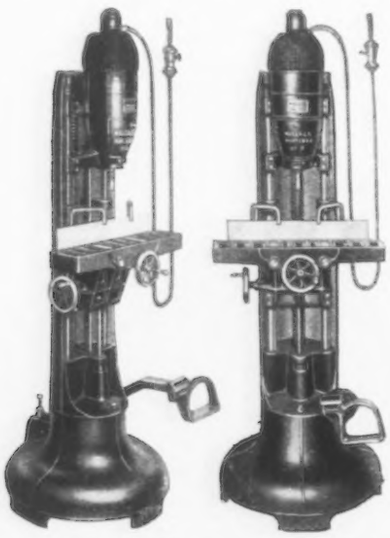
derstood by all mechanics, this method of measuring is said to have the advantage of using the same instruments and the same set-up as the tool maker must use to check the finished job on a surface plate.

Controls are simple and are grouped to facilitate operation. The net weight of the No. 1 jig borer is 2650 lb. and of the No. 1A, 2800 lb. Floor space occupied by the machines is 58½ in. by 59 in. The table working surface is 9¾ by 18 in. and the table longitudinal and transverse travels are 18 and 10 in., respectively. In the No. 1 machine the minimum and maximum distance from the table top to the spindle end are 1¾ in. and 10¾ in. and in the No. 1A machine these distances are 6¼ and 15¾ in. In both machines the spindle head travel on the column is 5 in. and the spindle quill travel 4 in. The distance from the center of the spindle to the face of the column is 9¼ in.

Extra equipment includes a new rotary table for extremely accurate indexing, this table being offered for use in boring circular jigs and drill plates which are most easily laid out by using polar dimensions, i.e., angle and distance from center. It is available for use on other types of machines also. The table has a scraped surface 12 in. in diameter and is arranged for clamping to the regular rectangular table of the jig borer.

## New Electric Hollow-Chisel Mortiser

Simplicity is a feature of a new portable electric hollow-chisel mortiser of ½-in. capacity which has been brought out by J. D. Wallace & Co., 134 South California Avenue, Chicago. All attachments and adjustments not required in ordinary work have been omitted and casters have been provided in the base to facilitate moving the machine from one location in the shop to another.



*The Capacity of the Mortiser Is For Holes Up to ½ In. Square and 17/32 In. in Diameter. Casters are provided in the base of the machine*

The machine is driven by a special General Electric vertical motor, which operates at constant speed under the maximum load, and is kept cool by air drawn through a screen at the top. The air is forced downward by a fan on the armature shaft and, in addition to cooling the motor, serves also to cool the chisel and bit and blow away the chips. The chisel holder is built into the lower motor end-flange, which entirely incloses the bit chuck mounted on the motor shaft. The operating speed is 3450 r.p.m., which is said to be suitable for all work falling within the capacity of the machine, square holes of ¼, ⅜ and ½ in., or round holes up to 17/32 in. in diameter. The motor is entirely inclosed and dustproof. Seepage of oil from the bearing down into the motor, causing trouble in the armature, is avoided by the use of an oil slinger on the armature shaft, just below the ball bearing. Oil dripping from the bearing is caught by this slinger and thrown into an annular chamber which conducts it away from the motor.

Depression of the motor head of the machine for mortising is by means of the foot treadle. The latter has an iron stirrup which hangs vertically and is turned outward to accommodate the foot of the operator as he stands in a natural position. The head may be adjusted for any lower position desired by means of a set screw in the rear of the base, and is automatically carried back to the upper position by an adjustable tension spring. The table of the machine slides on accurately machined rods and is adjusted vertically and horizontally by means of conveniently located handwheels. Means are provided to maintain alinement at all times and to take up any play which may develop in the slide rod bearings. A steel fence and two hold-down rods are fastened to the rear of the table. The maximum distance from the center of chisel to the fence is 3 in.

## Compressed Air Hoist on Side of Building

IN the illustration is shown a compressed air hoist with "turbin-air" motor made by the Sullivan Machinery Co., Chicago. This equipment is fastened to the side of a foundry building and is used for hoisting pattern skids for shipping machines from one level to another. The machine weighs 345 lb. It will lift one ton on a direct single line or will pull a 50-ton freight car on a level track.

*Pattern Skids and Other Pieces Are Hoisted from One Floor to Another*

Reports from 1500 employers in Illinois, employing 363,944 workers, indicate that employment in March gained 0.7 per cent. The gain in car and locomotive shops was 16.2 per cent; in iron and steel, 5 per cent; in automobile accessories, 8.1 per cent; in electrical apparatus, 5.5 per cent, and in farm implements, 1.4 per cent. Foundry reports were somewhat more optimistic, especially from larger units. In spite of these increases there were 5.4 per cent fewer people employed in Illinois metal establishments at this time than in March, 1927.

# Foreign Trade Outlook Favorable

## Increasing World Production Begets More Consumption—Expansion, Rather Than Curtailment, of American Trade Best Way to Aid European Recovery

BY JAMES A. FARRELL*

ONE of the indications of the accelerating pace of world commerce that many of our traders have felt in their own business is the stiffening competition they are encountering in some of the so-called neutral markets. But we are meeting it, and it justifies a certain optimism on our part that our sales are expanding just as rapidly, in many cases a little more rapidly, than those of our competitors.

There is a specially significant phase of last year's trade figures. It is that, although total values of raw material imports, both into the United States and into other industrial nations, were smaller than in 1926, volume of such imports was generally larger. That means, of course, increasing production. That definitely indicates continuation for some time, at least, of the stiffer competition just referred to, for the immediate effect of expanding industrial activity is naturally more active sales effort.

### Competition Most Severe in a Narrow Market

The ultimate effect, however, is a more cheerful subject of contemplation. For out of increased production and sale comes inevitably increased consumption. It is in the narrow market that competition is most severely felt. As the market broadens that severity decreases. But markets can broaden only as their producers go ahead, as the margin for accumulation develops, in a word, as prosperity manifests itself.

It is only natural that Europe, which suffered most from the war, should be slowest in gathering headway for recovery. In our eagerness to get ahead we must not be impatient at Europe's lower rate of progress. Americans have already been vastly helpful in many ways, which is both appropriate and creditable.

But continuation of that course need not involve us in any departure from sound economic method or legitimate business endeavor. It is not necessary for us to relax our efforts in any market in order to speed up European recovery. We shall be better able to keep up, and even expand, our present course of helpfulness by going on with the forward movement of our trade, than we should be by restricting our efforts for the purpose of giving wider scope to European activities. Curtailment of our enterprise for such a purpose would not only prove detrimental to us, it would not benefit Europe. She will complete her recovery and regain prosperity by hard work, not on doles.

### One Country Thrives as Other Lands Thrive

For in this modern world of highly developed transportation and communication national isolation is no longer possible. Conditions in one country react upon the others, and it is as our prosperity is maintained that the best result in Europe will be achieved.

During nearly 1800 years of the Christian era the struggle with conditions of living made only little more than negligible advance. Transportation by sea improved. Ships were larger, stauncher, faster and more skilfully handled. But transportation by land was of the same general character as in the days of the Romans, and roads were seldom as good as those the Romans made.

The nineteenth century gave us the railroad, the steamship and the telegraph.

The twentieth century has already given us the automobile, the airplane and the radio.

With these six agencies of transportation and communication the world has made more advance in the last century and a quarter than in all previous recorded time. Yet we are hardly more than over the threshold.

These six things have given new meaning to our life and our work. They have helped us the better to visualize the true relationship that we in this country bear to those in any other land. No longer is it possible for human life anywhere within the range of these six agencies of advance to go on as it did a hundred years ago in the simple routine of ordinary existence.

Now it is gradually coming into the active consciousness of all men everywhere that there is something of both give and take in the mere fact of the existence of numbers of other men elsewhere. The labor, the products and the service of one people constantly ameliorate the life of all other peoples, and all are coming to realize it.

Inasmuch as an important part of the program of this convention deals with the trade relations between the United States and our Latin American neighbors, it will not be out of place for me to say something as to the views of business men generally in the United States, with whom I frequently come in contact, concerning the republics to the south of us.

### Trade Demands a Stable and Self-Contained Latin America

We have only one desire for them. We wish them peace, unbroken and undisturbed, from any source, either of international aggression or civil contention. We desire to see them all and always strong, stable and self-contained, for that is the best assurance of uninterrupted tranquillity. We want to have them go their own way, to work out their own destiny, with peaceful purpose and by peaceful methods, and we should be happy indeed if there might never arise any situation that demanded other resort.

That, I am confident, is the hope and wish of American business for all of Latin America. And I am very sure that American business will be found uniformly and unfailingly glad to be of any possible help to make that hope effective in realization.

But I should not have stated this position fully if I were to fail to add one thing in explanation of this attitude. It is the frank admission that our primary motive is intensely practical. In desiring to see all of Latin America always stable, strong and peaceful, we are not actuated by idealism or altruism. Both are strong and high motives. But ours is, after all, an even stronger reliance upon that basic human desire, which has been chiefly responsible for all world advance, the primal urge to better our own circumstances of life.

For we know that peace is the best condition for

*President United States Steel Corporation and chairman National Foreign Trade Council. Abstract of an address by Mr. Farrell read before fifteenth convention of National Foreign Trade Council, held at Houston, Tex., April 25 to 27.

trade and prosperity. Therefore, we want Latin America peaceful. We know that trade is the chief agency of prosperity. We seek prosperity for ourselves, and we seek it through trading with Latin America. Therefore, we want Latin America to increase in prosperity, so that out of her increase in trade we may derive a share.

We who are producers and traders in the United States have very much in common with the peoples of Latin America, as for that matter we have with the other peoples of the world. We have learned from experience and observation that trade begets trade. We have noted that if two nations merely trade with each other that trade is often neither as profitable nor as beneficial as if the same exchange occurred through other countries as well. We know that it is not a mere coincidence that those nations which display the greatest industrial activity in competition with us are at the same time the heaviest purchasers of our products, manufactured as well as crude. It is production that gives buying power, and it is buying power that consumes.

So we wish for Latin America and for all the world peace, strength, stability and prosperity. So will their trade grow and thrive. So will ours advance. So will foreign trade progress.

## BUILDING OUTLOOK GOOD

### Increased Construction the Result, Not Cause, of Better Business Conditions—No Signs of Boom

"THE general level of building activity that has prevailed during the past three years probably represents the new standard or normal level for the industry in this country, and there is no reason to expect any material recession from this level in the future," said Virgil Jordan, chief economist of the National Industrial Conference Board, New York, in a recent address before the Credit Association of the Building Trades of New York.

"The immediate outlook for building," Mr. Jordan said, "depends chiefly upon general business and credit conditions in the next few months, and in these respects there is nothing to worry about, even though money may be temporarily tighter and business a little hesitant during the summer. It is far more reasonable to expect that after the stock market has had some of its speculative enthusiasm knocked out of it, easier money and rising prices will stimulate speculation in commodity markets and lead to a rapid and general expansion of business which will carry building along with it to still higher levels next year.

"In the building industry as in all other fields of business, it is high time that we throw overboard some of our traditional ideas of what is normal and proper and recognize that we live on a radically different plane of public demand and industrial accomplishment than before the war.

"Economists and statisticians like to fit all the ups and downs of business into regular cycles and to make its development conform over long periods to a smooth curve of growth. These formulas may be true enough as a historical record of our brief past, but there is no reason to suppose that we are chained to them for the future. Business is no mere machine following purely mechanical laws; it is determined fundamentally by changes in human psychology, but these the statistician has no means of taking into account.

"This is particularly true in its application to the building industry. During the past five years statisticians have been wrangling about the length of time before the war-time 'shortage' in building will be made up and the probable return to some 'normal' of building activity. Invariably these calculations have been upset by the facts, because the future growth of any fundamental type of consumption demand, such as building, cannot be measured by any purely statistical means.

"The deficit in building during the war has very little, if anything, to do with the level of building activity in the past few years or at the present time. The level of building, like that of industrial and trade activity, is not determined by what happened in the past but by the way we feel and the things we want now and in the future. The demand for building depends not merely on the growth of population nor even upon the size of the existing population, but upon the current ideas, habits and customs of the public in respect to building accommodations and services and upon their general purchasing power or effective demand for such services.

"It is far more accurate, therefore, to say that the level of building activity today depends upon general business conditions and national prosperity than to say, as we used to, that business activity and prosperity depend upon the amount of building that is done. Vast as the building industry is, our business activity has grown more rapidly in extent and variety, so that business is relatively less affected by building construction than the building industry is by business, and the relation between the tail and the dog has become more normal.

"Instead of talking about building shortages as a result of the war or about the building 'boom' during the past three years, we should rather consider that throughout the entire past the United States has been underbuilt from the point of view of current standards of living.

"So far as the question of disposable capital for building purposes goes, there is no ground for fearing any stringency in the long run. The constant flow of capital abroad and the outburst of speculation in the security markets all testify to the fact that even now the United States is saving a larger part of its national income than it should and is investing it in ways far more questionable than even the most speculative forms of building investment can be considered to be. Changes in our financial system and banking conditions at home and abroad are releasing increasing credit resources, which can be drawn upon for building purposes. If they are not used for such purposes they will be used for other types of speculation and investment far less sound from an economic or social point of view."

## Milton Mfg. Co. Reorganized; W. W. Wilson New President

The Milton Mfg. Co., Milton, Pa., manufacturer of iron bars, bolts, nuts, rivets, etc., which was recently discharged from receivership, has been reorganized with a new board of directors and the following officers have been elected by the board: W. W. Wilson, president; R. W. Krise, vice-president; Harry W. Chamberlin, secretary; O. S. Stamm, treasurer. Mr. Wilson, the new president, was one of the receivers of the company. The following executive committee was also named: Mr. Wilson, Mr. Chamberlin, N. Thompson Marsh, James B. Graham and Seth T. McCormick, Jr.

The stockholders elected the following board of directors: William P. Beeber, president First National Bank, Williamsport, Pa.; William Cawley, vice-president Peoples Savings & Dime Bank & Trust Co., Scranton, Pa.; Harry W. Chamberlin, president Milton National Bank, Milton, Pa.; Chauncey P. Colwell, Cassatt & Co., Philadelphia; William C. Dickerman, vice-president American Car & Foundry Co., New York; James B. Graham, president Lycoming Trust Co., Williamsport, Pa.; Raymond W. Krise, vice-president Milton Mfg. Co.; N. Thompson Marsh, president Milton Trust & Safe Deposit Co., Milton; Seth T. McCormick, Jr., Williamsport, Pa.; Arthur Peck, Harper & Turner, Philadelphia; Vandling D. Rose, Scranton, Pa.; W. Walter Wilson, president First National Bank, Milton.

Current manufacturing problems, such as labor conservation, excessive competition, overproduction and shrinking profits, will be discussed at the sixteenth annual meeting of the Chamber of Commerce of the United States to be held in Washington, May 7 to 11.

## Neville Island Blast Furnace to Be Operated by Sharpsville Furnace Co.

The Sharpsville Furnace Co., with offices in the Oliver Building, Pittsburgh, and operating a merchant blast furnace at Sharpsville, Pa., has purchased from the United States Steel Corporation the Neville furnace, on Neville Island, Pittsburgh. This furnace, owned by the American Steel & Wire Co., long has been under lease to the Carnegie Steel Co. It has not been operated much since it was relined in 1925 and when last in blast was used in making ferromanganese. Included in the purchase is a considerable area of land, which will be utilized as a site for a by-product coke plant and cement works. A coke plant on this location will have the advantage of low freight waterborne coal. The Sharpsville company some years ago considered the building of a by-product coke plant at Sharpsville, but abandoned the idea because of high freight rates on coal and the lack of an adequate market for the gas.

Close relations exist between the owners of the Sharpsville Furnace Co. and those in control of the Koppers Co., and the latter will build the by-product coke plant, the coke from which will go to the Neville and Sharpsville furnaces, while the gas is to be used in burning cement.

An interesting phase of the deal is the fact that it means a merchant blast furnace for Pittsburgh and probably a further limiting of the movement of merchant iron from the Valley furnaces to the Pittsburgh district, since the freight charges from Neville Island to representative Pittsburgh district consuming points are 63c. to $1.13 per gross ton, compared with $1.76 from Valley furnaces. For some time, Valley furnaces have not been able to get into the Pittsburgh district with basic iron on account of more favorable freight rates to consuming destinations enjoyed by Pittsburgh district steel companies having surplus iron production. The Neville furnace will make Bessemer and foundry grades as well as basic iron and having a rated capacity of 600 tons a day is bound to be a factor in the Pittsburgh merchant iron market.

The Neville furnace was built in 1900-01 and blown in July 3, 1901. It was last relined in 1925 and having had little use since is said to be in condition for immediate resumption. The other furnace of the Sharpsville company was originally built in 1847 and was rebuilt and enlarged in 1923; it has a rated capacity of 400 tons a day.

## Czechoslovakian Works Refuse to Pay Cartel Fines

WASHINGTON, April 30.—The Skoda Steel Works and the Poldi Steel Works of Czechoslovakia are reported to have refused to pay a share of the overproduction fines assessed against the Central European Steel Cartel by the International Steel Cartel for exceeding their quotas during the past year, according to a report received by the Department of Commerce from Prague.

Both companies have produced considerably more steel than the tonnages assigned them under the cartel agreement, it is stated, but, as they use practically all of their steel production for further manufacture in their own plants, their production, although statistically included in the Czechoslovakian national quota, is claimed by them to be exempt from the provisions of the cartel agreement. The Central European Steel Cartel applies to ingots, shapes, bars and plates. In determining the capacity of Czechoslovakian steel plants, the Skoda and Poldi works were included in spite of the fact that they produce almost none of this material. It is pointed out that they have been considered as part of the cartel, although they were never actually members.

As a result of their refusal to pay fines, the report says, it is assumed that Czechoslovakia's steel quota will be reduced by the amount of the allotments assigned to those plants. A further reason advanced for the action of the Skoda and Poldi companies is that they prefer not to make public their steel production figures as is required by members of the cartel.

## German Wire Mills Establish Experimental Plant

HAMBURG, GERMANY, April 15.—German wire mills have established an experimental plant through the wire makers' association. Under the registered name of "Weka," the plant, owned in common by the members of the association, will make a wide range of wire products, including nails, barbed and fencing wire, both plain and galvanized. Experiments will be made to improve the quality of the product, to reduce labor costs, to better manufacturing methods, distribution, etc.

This is the first plant of this type to be established in Germany, and all results will be for the use of numerous small wire mills, which make up the membership of the association.

## Purchasing Agents to Meet in Kansas City

Preliminary announcement has been made of the thirteenth annual convention and Inform-a-Show to be held in Kansas City, May 28 to 31, by the National Association of Purchasing Agents. The sessions and the exhibition will be held in the American Royal Building. The arrangements will be such that those attending the sessions will pass through the exhibit to reach the meeting rooms. G. A. Renard, 11 Park Place, New York, is secretary-treasurer.

## Market for Road Machinery in Czechoslovakia

An American export house recently established an agency in Prague, Czechoslovakia, to represent 14 American manufacturers of road-building and construction machinery, according to a report received by the Department of Commerce, Washington, from the assistant trade commissioner at Prague. The report says that larger American units, such as steam-rollers or large power shovels, find no market in Czechoslovakia, but that prospects for specialized American equipment have improved.

## Industrial Stocks of Coal Slowly Decreasing

Stocks of coal on hand in industries of the United States and Canada are estimated as of April 1 by the National Association of Purchasing Agents at 45,744,000 net tons. This compares with 47,388,000 tons on March 1. There has been a slow decline from the 60,154,000 tons on Oct. 1 last. Industrial consumption in March is estimated at 38,268,000 tons—the largest for any month in a year. It compares with 36,301,000 tons in February.

The supply of coal in industry is estimated at 24 days for steel mills, 36 days for by-product coke plants, 38 days for railroads, 57 days for electric and gas utilities, and 36 days for other industries.

## Germany Seeks Newfoundland Ore

HAMBURG, GERMANY, April 15.—As a result of a protracted strike at the Swedish iron mines, shipments to Germany have decreased from 1,000,000 tons of iron ore a month to about 345,000 tons in March. A further decrease for April is expected, as stocks of ore at Narwik and other Swedish ports are almost gone.

The reduction in the available Swedish supply of iron ore has influenced a few steel makers in Germany to seek to contract for almost the entire output of Newfoundland mines. Newfoundland ores have a lower iron content than the Swedish, but their higher silicon and phosphorus content make them quite suitable for use in Bessemer steel production and their smaller manganese content is an advantage. The steel makers in question hope to be able to secure from 85 to 90 per cent of the Newfoundland exports of iron ore this year.

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# This Issue in Brief

**Eliminates defective castings** by "single-heat" annealing. Annealing cycle of malleable castings is based on an anlysis of the iron in each heat. Close control of temperature has reduced average combined carbon to 0.03 per cent.—Page 1209.

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**Doubts whether pearlitic iron** castings will be produced to any great extent in this country. To avoid confusion, pearlitic castings must be produced in separate building, which would necessitate providing new capacity, Dr. Moldenke says.—Page 1241.

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**When you weld high-chromium alloys** be sure the joint is clean. The flame should be strictly neutral and of minimum dimensions. Rustless irons require annealing after welding, to soften and toughen the metal at the joints. But rustless chrome-nickel irons, being non-air-hardening, need not be annealed.—Page 1242.

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**Business in metal trades shows improvement** over last year. Forty-eight per cent of National Metal Trades Association members report business as "excellent" or "good," while 52 per cent find it "fair" or "poor."—Page 1246.

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**Reduces process inventory more than 50 per cent** by paying foremen a bonus based on work in process. If the foreman succeeds in keeping the work in process in his department within the limit of the budget he gets a bonus of 10 per cent of his salary.—Page 1289.

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**Unemployment due to mechanization is as yet an economic myth,** says chief of Industrial Conference Board. Mechanization of industry is a relatively slow process, and usually allows sufficient time for readjustment. Slack is taken up by non-industrial occupations.—Page 1246.

**Pay your foremen a bonus** and increase your profits. One manufacturer bases foremen's bonus on relation of actual operating expense to shipments. Another calculates it on bonuses earned by the men in the foreman's department. — Page 1289.

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**American manufacturers of machinery,** iron and steel are increasingly successful in foreign markets. March shipments of machinery were highest in seven years, and iron and steel were largest in four years.—Pages 1294 and 1296.

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**Eliminates rats and pin holes in castings** by using a special vent board. Venting pins of varying heights pierce the mold, allowing steam and gas to escape. The pins are so fixed that they conform to the configuration of the cavity.—Page 1212.

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**Permanent mold process produces gray iron castings as heavy as 25 lb.** Castings with and without cores are made by the Holley sandless process. Pouring is done on an automatic turntable carrying 12 molds.—Page 1214.

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**No cupola trouble in more than two years.** Holley foundry follows usual cupola practice in production foundry. No alloys or special fluxes are used.—Page 1216.

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**Profits from manufacturing are steadily increasing,** says economist. Average profit has risen from 6 per cent in 1880 to 10.5 per cent in last six years. He doubts that 40 per cent of industrial corporations are non-profit-making, declaring that defunct corporations are included in income tax lists.—Page 1246.

**Expert manipulation is necessary** to get satisfactory results in making pearlitic iron castings. Silicon content must be low and molds must be hot. Extra care is required with pattern equipment, gates and risers.—Page 1241.

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**"Accident proneness" and low intelligence** do not always go together. Though investigations have revealed that a material percentage of workers has a high accident liability rate, as yet no test has been devised which will enable an employer to detect those workers.—Page 1264.

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**Get best results by developing their own welders.** Shop men of good character and more than average ability are put through a period of training. Apprentice is considered to have "graduated" when he can make butt welds which can be consistently bent 180 deg. around a pin five times the thickness of the plate.—Page 1244.

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**Believes profits can be estimated a year in advance.** Walworth Co. is able to forecast its financial, labor and material requirements by means of a budget, and now believes that profits and the trend of prices can be reliably plotted in advance.—Page 1290.

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**American manufacturers should not relax** their efforts toward building export business, says James A. Farrell. For that would delay rather than hasten the recovery of Europe. Tremendous strides made in transportation and communication facilities portend a great growth in world trade.—Page 1257.

ESTABLISHED 1855

# THE IRON AGE

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## Business and Economic Outlook

AT the end of the first third of 1928 we are able to get a fair comparison with the forecasts offered on the eve of the new year. These appear to have been generally sound and it looks like 1928 turning out about as expected. Much of the recession in business that came in the latter part of 1927 has been recovered. Automobile manufacturing has revived. Transactions in the stock market have swelled to unparalleled volume. About the only thing unexpected has been a large degree of unemployment, and that has been rather an awakening to a realization of it than a sudden development. The political issue that will be in the forefront this year is not one calculated to upset business.

Thus general conditions remain about the same: Steadily increasing population. Great activity in the creation of consumption goods. Profitless prosperity in all of the old over-equipped industries, wherein there is consequently intense competition. Great profits in new industries that furnish what the people want and that have not yet become over-equipped. Plethora of means for doing new things, both financial and material. Low interest rate. Low rate of yield from investments. The outlook is that all of these conditions will continue about the same.

Such excesses as there are in the stock market will of course be corrected. The gamblers who buy things with the hope that they will go up 10 or 20 points in a day or two will receive a shock. This may not be very far ahead. When the yield of securities, actual or prospective or both, falls below the interest rate it is bad business to borrow money to buy stocks. Such a correction will not spell a general or major decline.

Many stocks have not risen at all. Some have declined. It has been a selective market, truly reflecting the difference between great industrial profits and profitless prosperity.

Stocks of goods have not accumulated. There is no such thing as frozen credits in sight. Loans on securities are high, but that is a kind of credit that never freezes. We have not locked up capital in enterprises that have been unfruitful or mistaken. We are increasing our claims upon European industry.

Our most dangerous symptom is political, as evidenced by desires of Congress for a Muscle Shoals adventure, a Boulder Dam favor to local interests, a recklessly planned Mississippi River flood control, a price-fixing farmer relief bill, and a rejection of the well-considered Treasury plan for tax reduction. President Coolidge alone stands in the way of such perpetrations. It is not surprising that he is tired of politicians winning their way to Congress under the gonfalon of Coolidge prosperity and then contemptuously disregarding his leadership. It is a bad symptom that politicians should want to do such things. With a president of less intelligence and courage, with perhaps a revival of the policy of harassing business, bad times might readily be produced. The association between economics and politics is always close.

## Indexes That Do Not Index

THAT the many "indexes" of business conditions need to be interpreted with care is emphasized by the data regularly published on the use of electricity. One journal collects statistics of electrical consumption from about 3000 large manufacturing plants in various industries, scattered throughout the nation, and derives a curve which is taken to indicate general business activity in the United States. The data are also segregated for various industries. We quote from the comment on the steel industry.

> The rate of operations in the rolling mills and steel plants was quite significant, standing at 6.8 per cent under February. . . . A decreased rate of operations was normal during March, but the drop this year was more than was to be expected.

While we do not doubt that the plants canvassed actually have used less electricity in March than in February for the last few years, it is a mistake to conclude that the peak of winter operations in the steel industry is reached in February, for statistics of both pig iron and ingot production show that the

peaks were reached in March or April in 1924, 1925, 1926 and 1927. As for 1928, rather than the 6.8 per cent decrease reported above, the real tonnage is as follows (daily rates):

| | Pig Iron, Gross Tons | Steel Ingots, Gross Tons |
|---|---|---|
| February, 1928.... | 100,004 | 161,812 |
| March, 1928..... | 103,215 | 166,945 |
| Increase ..... | 3.2 per cent | 3.2 per cent |

The question will naturally be asked how far the discrepancy between a supposed 6.8 per cent reduction and an actual 3.2 per cent increase is due to the fact that the nights were getting shorter and the electric light bill was getting smaller.

## What Is Yankee Ingenuity?

A UNIQUE problem faces the Worcester Polytechnic Institute. Henry J. Fuller, of the institute's class of 1895, has endowed a scholarship, the deed of gift specifying that it shall be awarded to the entering freshman who has exhibited the greatest amount of "Yankee ingenuity." It is a worth while scholarship, for it will be enough to pay college tuition and other fees for the course and give the recipient an additional sum for other expenses. But what is "Yankee ingenuity," and what test shall be given the applicants to determine which is most worthy of the award?

The institute authorities were puzzled and decided to seek counsel among engineers and executives. A group of 50 such men was selected and each was requested to submit a definition of "Yankee ingenuity" and to suggest a basis upon which candidates for the scholarship should be judged. The answers will be turned over to the committee entrusted with the award, consisting of Frederick H. Payne, president of the Greenfield Tap & Die Co., Edmund C. Mayo, president of the Gorham Mfg. Co., and Ralph E. Thompson, vice-president of the Gillette Safety Razor Co. Here are some of the definitions or excerpts from definitions as submitted to the institute:

Owen D. Young, chairman of the board of the General Electric Co., sends this as the best reply received from the members of his staff to whom he submitted the question:

Ingenuity, according to modern usage, suggests an inventive power which is at once nimble and effective; a readiness in apprehending or devising new and effective means for the accomplishment of any given purpose.

Dr. Michael Pupin of Columbia University:

Performance of an old stunt in a new and remarkably simplified way.

John F. Stevens, past president of American Society of Civil Engineers:

It is merely the application of good, old-fashioned common sense to the ordinary affairs of life and the most important factor in the correct solution.

Joseph W. Powell, formerly president of the United States Shipping Board Emergency Fleet Corporation:

It is closely allied to common or "horse" sense. A boy with common sense will find the simplest and the quickest way of accomplishing his purpose with the least expenditure of time and energy.

Henry D. Sharpe, treasurer of the Brown & Sharpe Mfg. Co., and Prof. A. D. Meade of Brown University got together on the question and evolved "gumption" as the answer.

Homer L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co:

Yankee ingenuity is that quality of mind which enables the possessor to grasp a problem and to solve it in a manner at once simple, direct and practical as well as frequently surprising. Imagination, wit and common sense applied to the solution of problems mechanical or otherwise. The knack of solving difficulties.

George A. Perry, mechanical engineer of the Jones & Lamson Machine Co:

I suppose that Yankee ingenuity is, after all, just plain ingenuity, or, we might say, the quintessence of ingenuity. Probably a good definition of ingenuity is cleverness and originality in designing something or in making something to fit the needs from the material one has.

Frederick W. Shibley, vice-president of the Bankers Trust Co., New York:

Yankee ingenuity implies the inherent ability of solving a knotty problem in a simple and ingenious way, of accomplishing a difficult mechanical job without employing the customary tools. It implies cleverness rather than trained skill.

Frederick H. Payne, of the committee:

Ability to succeed under trying circumstances. (As a method of award he suggests the careful selection of a list of boys to whom a set of questions would be submitted. The boy who is finally selected must be full of ambition.)

## Steel Earnings and Tonnage

INCREASE in earnings of steel companies in the March quarter, over the December quarter, were due almost entirely to an increased volume of shipments, and that fact should be emphasized. It is true the producers were all seeking higher prices, having begun to announce advances in November of last year; but substantial results did not accrue even in March. It has always taken time for market advances to work out in actual invoices and the recent period has been no exception.

From the December to the March quarter the Steel Corporation's earnings increased 31 per cent, and such estimates as can be made would indicate that its shipments increased by more than 31 per cent. If so, there would be no inference that invoice prices on identical products decreased at any point.

The Bethlehem Steel Corporation makes a definite statement to the effect that its average billing prices rose 34 cents a ton, and presumably the computation was made by comparing identical materials. Bethlehem's net earnings, after interest, depletion, depreciation and federal taxes, increased by 43 per cent, but that is not comparable with the Steel Corporation's increase, which is before interest (except subsidiary company interest), depletion and depreciation.

First quarter earnings of the steel industry were not even fair despite the increase; and that is not all, seeing that the increase was due to tonnage, for first quarters normally run above the average in tonnage. In the past three years first quarter steel production has been 10 per cent above the year average and 14 per cent above the average of the other three quarters.

Fully integrated steel companies have not been

averaging earnings much above $10 per gross ton, before payment of interest and allowances for depletion and depreciation. In no year since the war has even the United States Steel Corporation averaged as much as $15, with a computation based on assigning all its earnings to the steel products it ships, making no allowance for earnings otherwise accruing.

Various styles are followed in computing or estimating earnings per ton of steel shipped. It is manifestly unfair to consider a dollar earned when there must still be deducted from it an allowance for depreciation, let alone depletion. That is very strongly the case with the steel industry as now conducted, for there is energetic competition in the making of improvements calculated to reduce cost. Depreciation is not an allowance to maintain the *status quo* of the equipment. The design wears out as well as the physical entity, and facilities must be maintained up to the general state of the industry, which is constantly advancing. Earnings have not really been made until all such depreciation has been allowed.

On that basis the integrated steel companies have not been earning more than about $10 per gross ton if as much. The Steel Corporation's depletion and depreciation reserves of subsidiary companies last year amounted to $3.64 per ton of steel products shipped.

## French Primacy in Steel Exports

IT was the common judgment that France could not take a position in world trade in iron and steel at all commensurate with the primacy in iron ore resources given her by the Versailles treaty. It was said, and the record bears it out, that the French steel makers had shown no such capacity for developing outer markets as had put their British and German competitors in command of so large a share of this trade. The statistics of the first few years after the war further supported the legend. But the past few years have witnessed a steady gain in French exports. In 1926 they were not far behind those of Germany and 1927 was signalized by the advance of France, for the first time in history, to the position of leadership in the iron and steel trade of the world.

The compilation of the National Federation of Iron and Steel Manufacturers, London, gives the total of iron and steel exports from France in 1927 as 5,602,500 tons, or nearly a million tons above that for the nearest competitor, Belgium-Luxemburg, and nearly 1,500,000 tons more than France exported in 1926. Thus there is a complete recasting of the positions of the six nations which do most of the world's international trade in iron and steel. Before the war Germany was first and Great Britain second, their exports being 6,207,600 tons and 4,969,200 tons respectively in 1913. France, with a total of only 619,200 tons in that year, has climbed from the bottom of the ladder, and with her advance to first place last year, Germany is further displaced by Belgium-Luxemburg. Thus the order, after France, becomes: Belgium-Luxemburg, 4,606,900 tons; Germany 4,230,300 tons; Great Britain, 4,199,700 tons; United States, 1,942,700 tons.

It is noteworthy that France has not made headway against Germany, Great Britain and the United States in the Orient or in South America or Africa. Her gains have been largely in exports to Great Britain, Germany and Belgium, which together take over 60 per cent of French steel exports, the largest item being steel in semi-finished form.

## Detecting Accident Proneness

MANUFACTURERS who have studied the accident record of their employees seem to agree that "accident proneness" is a definite mental characteristic of a material percentage of the workers. It is believed, moreover, that this tendency to make industrial occupation more hazardous to one individual than to another is not always heedlessness and carelessness, but in many cases is a form of temperamental instability associated with other traits in an employee. Among these latter are the habit of "reporting sick," under the urge of hypochondria or with the intention to malinger, and inefficiency as an industrial unit. In other words, the kind of man who is not mindful of known hazard and whose brain is slow to react in unexpected danger is also apt to remain away from work unnecessarily, and when at work produces below the standard for his task.

This mental combination has been given much attention by the British Industrial Fatigue Research Board. The investigators of the board are seeking a means of sifting out these undesirables from those seeking employment. Experiments on groups of workers have included tests of reasoning ability, which seemed to show that the man of high intelligence may meet with accidents as readily as the man of low intelligence. Capacity to coordinate was shown to be a factor of large importance.

A series of three tests demonstrated that those who failed to pass them satisfactorily had an accident rate 50 per cent higher than those who passed. Yet the board in a recent report frankly admits that tests so far devised are inadequate and impracticable for everyday use. The hope is expressed, however, that eventually a formula will be worked out enabling employers to separate between the safe man and the unsafe.

With the experience at hand, it would be difficult to convince those who conduct employment offices of American industrial plants, and others having intimate contact with the average run of shop workers, that any cut and dried mental examination could be effectively applied to applicants, with their widely ranging intelligence, different nationalities, and all varieties of temperament from the ultra-phlegmatic to the emotional. Dependence on compulsory physical examination is now very general, and it has proved invaluable as a preventive of accidents, because it insures that no person be put to work where the nature of the job couples with a physical weakness that increases the hazard. Employment managers greatly desire to find an equally reliable psychological test which would show the absence or presence of temperamental instability, meaning thereby inherited or acquired tendencies affecting a person's emotional reactions in a way that would make him more liable to accident. Those closest to labor are skeptical that any such test can be worked out.

# Moderate Gain in April Iron Output

## Estimates, Collected by Wire, Make the Daily Rate 2815 Tons or 2.6 Per Cent More Than March— Net Loss of One Furnace

WITH nearly all producers estimating the April pig iron output, data gathered by wire on May 1 show that the month's production made a gain over that of April amounting to 2815 tons per day or 2.6 per cent. The output of coke pig iron last month was approximately 3,180,900 gross tons, or 106,030 tons per day for the 30 days. This compares with an actual production in March of 3,199,674 tons, or 103,215 tons per day. This increase of 2.6 per cent in April contrasts with one of 3.2 per cent in March and with one of 8 per cent in February.

According to these preliminary returns there were six furnaces blown in and seven shut down—a net loss of one furnace for the month. The number operating on May 1 was 196, as against 197 on April 1. The Steel Corporation blew in three furnaces and shut down two during April, while independent steel companies put in two furnaces and shut down three. One merchant furnace was blown in and two were blown out in April. There was therefore no loss or gain in steelmaking furnaces, but a net loss of one merchant furnace.

Actual data for the April pig iron production will be published in THE IRON AGE, May 10. The table gives the estimated production by districts for April and the actual output for the three preceding months.

*Pig Iron Production by Districts, Gross Tons*

| | April (30 days) | March (31 days) | Feb. (29 days) | Jan. (31 days) |
|---|---|---|---|---|
| New York and Mass. | 208,346 | 216,224 | 204,744 | 203,715 |
| Lehigh Valley | 77,950 | 80,058 | 75,394 | 72,639 |
| Schuylkill Valley | 59,651 | 51,325 | 44,861 | 43,946 |
| Lower Susq. and Lebanon Valleys | 31,581 | 33,301 | 29,387 | 30,338 |
| Pittsburgh district | 663,370 | 639,693 | 597,543 | 582,497 |
| Shenango Valley | 100,537 | 101,946 | 90,179 | 77,023 |
| Western Penna. | 116,261 | 101,365 | 86,725 | 89,372 |
| Maryland, Virginia and Kentucky | 102,634 | 103,857 | 89,803 | 94,590 |
| Wheeling district | 115,104 | 133,764 | 118,108 | 108,188 |
| Mahoning Valley | 308,883 | 296,491 | 261,837 | 247,371 |
| Central and Northern Ohio | 336,423 | 330,176 | 294,427 | 313,697 |
| Southern Ohio | 25,430 | 25,729 | 24,773 | 32,480 |
| Illinois and Indiana | 693,118 | 715,439 | 639,763 | 608,771 |
| Mich., Minn., Mo., Wis., Colo. and Utah | 133,812 | 139,101 | 130,586 | 134,718 |
| Alabama | 199,342 | 223,314 | 207,108 | 224,132 |
| Tennessee | 8,458 | 7,891 | 4,888 | 6,284 |
| Total | 3,180,900 | 3,199,674 | 2,900,126 | 2,869,761 |

# *Personalities in Organizing Meeting of the American Foundrymen's Association*

IN meeting again in Philadelphia (May 14-18), interest in personalities of the American Foundrymen's Association is aroused, particularly in respect to those who took part in the momentous convention which was held in Philadelphia in 1896, May 12, 13 and 14, and out of which immediately came the American Foundrymen's Association. That the situation was ripe for a national institution of the sort was proved by the several hundred foundry executives who attended that 1896 meeting from widely scattered sections of the country. The foundry industry had already assumed large proportions, as outlined by the presiding officer, Francis Schumann, of Philadelphia, who became the association's first president. There were nearly 4000 separate establishments, said he, "with an aggregate capital invested of about $115,000,000, employing about 120,000 persons, whose annual wages amount to nearly $63,000,000. Some 2,600,000 tons of castings are produced annually, requiring some 430,000 tons of coal and coke. The total annual disbursements for material and labor amount to $114,000,000."

Of the participants in the first convention, there are now thirteen living who have served the association in an official capacity. Portraits of eleven of these are reproduced on page 1218, those missing from the group being Robert Taylor, Pittsburgh, and John W. Burr, Brooklyn.

Howard Evans represented J. W. Paxson & Co. at the organizing meeting, served as temporary secretary and then was elected treasurer, which post he kept until 1900. He had been for some years before 1896, as he was for many years after, the main motive power of the Foundrymen's Association, Philadelphia.

W. S. Mosher, Mosher Foundry & Machine Co., Dallas, Tex., was one of the eight vice-presidents elected at the Philadelphia meeting, he representing the Southwestern States.

I. W. Frank, then representing the Frank Kneeland Machine Co., Pittsburgh, and later long the head of the United Engineering & Foundry Co., was elected to the vice-presidency of the association in 1897.

A. I. Findley, in 1896 editor of *Iron Trade Review* and since 1905 editor of THE IRON AGE, was elected a vice-president in 1902.

Jesse Jones, now a director of the association, and long identified with the Westinghouse Electric & Mfg. Co., was with the William Cramp & Son Ship & Engine Building Co., Philadelphia, at the time of the organizing meeting.

S. D. Sleeth, now living at Cambridge Springs, Pa., was of the Westinghouse Air Brake Co., then with headquarters at Pittsburgh.

Stanley G. Flagg, the eleventh president of the association, and engaged throughout the 32 years since the association began in the business of Stanley G. Flagg & Co., was chairman of the committee which nominated the first slate of officers.

S. T. Johnston was with the Whiting Foundry & Equipment Co. in the association's early days, though for years has been synonymous with the S. Obermayer Co., Chicago and Cincinnati.

John A. Penton attended the first meeting as the publisher of *Foundry*, of Detroit. He was the association's first secretary and worked prodigiously for the association's expansion.

Walter Wood was in 1896, as he is still, the dominating factor in R. D. Wood & Co., Philadelphia.

A. W. Walker, then as now of the Walker & Pratt Mfg. Co., Boston, was the association's sixth president.

Robert Taylor, who came to the first meeting for Taylor, Wilson & Co., Ltd., Pittsburgh, and now lives in that city, was the vice-president elected then to represent the Middle States.

John W. Burr, who later became a vice-president, was at the Philadelphia convention for the Burr, Houston Co., Brooklyn.

# Iron and Steel Markets

## Volume of Consumption Holds

### Short-Range Orders Make Mill Scheduling More Uncertain But Total Demand Keeps Up Surprisingly Well— Prices Weaker—Pig Iron Output Gains

THE sustained volume of demand, in view of developments in prices and production, is the most impressive feature of the steel market. Steel ingot output in the first third of the year probably established a new four-month record; finished steel prices are no longer advancing and in some lines are weakening, and buying is increasingly cautious. Individual tonnages placed are growing smaller, and at Pittsburgh some mills are dependent on day-to-day releases to complete their rolling schedules.

Yet the total volume of orders and specifications keeps up surprisingly well, supporting mill operations at a virtually unchanged rate. In spite of the fact that buying is at much shorter range, it is estimated that daily releases for rolling at Pittsburgh district mills are within 5 per cent of the average for the first three months of the year.

Much of this steel represents past commitments, and, while strictly new orders are on a diminishing scale, the amount of tonnage on which deliveries are asked—a better gage of consumption—shows little change. In the East, steel sales in April, including specifications against contracts, ran considerably ahead of the March tonnage. At Chicago there has been a recovery in new business and aggregate daily bookings are almost on a par with shipments. Ingot output in the Chicago district remains at 95 per cent of capacity, and in the Greater Pittsburgh district, at 80 per cent.

Pig iron production in April, estimated from telegraphic returns to THE IRON AGE, was 3,180,900 tons, or 106,030 tons per day, compared with 3,199,674 tons, or 103,215 tons daily, in March. The gain in the daily rate was 2815 tons, or 2.6 per cent. In both 1926 and 1927 April output of pig iron was at the highest rate of the year, coming one month later than peak production of steel, and it is likely that this year will follow that precedent.

While this relationship between pig iron and steel production appears to have been maintained, pig iron contrasts sharply with steel in aggregate output. Steel furnaces have been breaking records, but the daily rate of pig iron production last month was the smallest for any April since 1922, in that respect repeating the performance of January, February and March. This decline indicates a larger use of scrap in open-hearth charges.

The automobile industry is placing large specifications for bars, sheets and strip steel for May shipment, and it is believed that the seasonal slowing down in motor car manufacture will come at least a month later than last year. Two leading automobile builders are reducing production, one of them for a change in models, but the very slowness with which the Ford organization is getting geared up for large-scale output points to a compensating gain in its operations when other companies are expected to curtail.

The seasonal decline in farm equipment production also promises to be less marked than ordinarily. Tractor plants have such large back orders that they will probably not reduce operations at all. Early demand for harvesting machinery is unusually heavy.

In railroad equipment, the inquiries of the Erie for 1000 freight cars and 35 passenger cars, together with the fact that this road will repair 2485 cars in its own shops, comprise the most important activity.

Sheet prices have shown further weakness, and are now back to the low levels of last year. As is frequently the case in a soft market, Valley producers, in some instances, are quoting prices f.o.b. mill that are as low or lower than ruling market quotations on a Pittsburgh base. Galvanized sheets have declined to 3.60c., or $3 a ton below the last advance.

Hot-rolled strip has also given ground. On material 6 to 12 in. wide 1.80c., Pittsburgh, a reduction of $2 a ton, has become a fairly representative price, while 3 to 6-in. strip is selling at 2.05c., Pittsburgh, a cut of $1 a ton. Fender stock, affected by the reduction in automobile body sheets, is now quoted at 4.10c. to 4.15c., as compared with a recent price of 4.20c. At Chicago, prices on hot strip in narrow widths have been marked down $2 a ton.

Wire nails are being more freely sold at $2.55 per keg, Pittsburgh or Cleveland, a drop of $2 a ton.

English low phosphorus pig iron will soon penetrate to points as far inland as Chicago, the iron to come on boats built in England of a size to go through the Welland Canal. About 1000 tons of the English iron has been sold at Milwaukee, and it is being offered in Chicago and other Lake consuming centers at $26, delivered, duty paid. Except for a decline of 50c. a ton on Valley basic iron, prices for pig iron in principal producing districts remain steady. The change in the Valley brings basic to the lowest figure since November, 1915.

The British iron and steel trade, according to cabled reports, is agog over proposals looking to large scale amalgamation under the auspices of a new finance company of Great Britain and the United States.

A reduction in Valley basic iron has caused THE IRON AGE composite price for pig iron to decline to $17.59 from $17.67 last week. The finished steel composite price remains at 2.355c. for a second week.

# A Comparison of Prices

**Advances Over the Previous Week in Heavy Type, Declines in Italics**
**At Date, One Week, One Month, and One Year Previous**

| **Pig Iron,** Per Gross Ton: | May 1, 1928 | Apr. 24, 1928 | Apr. 3, 1928 | May 3, 1927 |
|---|---|---|---|---|
| No. 2, fdy., Philadelphia | $20.76 | $20.76 | $20.76 | $21.76 |
| No. 2, Valley furnace | 17.25 | 17.25 | 17.25 | 18.50 |
| No. 2, Southern, Cin'ti | 19.69 | 19.69 | 19.69 | 21.69 |
| No. 2, Birmingham | 16.00 | 16.00 | 16.00 | 18.00 |
| No. 2 foundry, Chicago* | 18.50 | 18.50 | 18.50 | 20.00 |
| Basic, del'd eastern Pa | 19.50 | 19.50 | 19.50 | 20.75 |
| Basic, Valley furnace | *16.50* | 16.50 | 17.00 | 18.50 |
| Valley Bessemer, del'd P'gh | 19.26 | 19.26 | 19.26 | 21.26 |
| Malleable, Chicago* | 18.50 | 18.50 | 18.50 | 20.00 |
| Malleable, Valley | 17.25 | 17.25 | 17.25 | 18.50 |
| Gray forge, Pittsburgh | 18.51 | 18.51 | 18.51 | 19.76 |
| L. S. charcoal, Chicago | 27.04 | 27.04 | 27.04 | 27.04 |
| Ferromanganese, furnace | 100.00 | 100.00 | 100.00 | 95.00 |

| **Rails, Billets, etc.,** Per Gross Ton: | | | | |
|---|---|---|---|---|
| O.-h. rails, heavy, at mill | $43.00 | $43.00 | $43.00 | $43.00 |
| Light rails at mill | 36.00 | 36.00 | 36.00 | 36.00 |
| Bess. billets, Pittsburgh | 33.00 | 33.00 | 33.00 | 33.00 |
| O.-h. billets, Pittsburgh | 33.00 | 33.00 | 33.00 | 33.00 |
| O.-h. sheet bars, P'gh | 34.00 | 34.00 | 34.00 | 34.00 |
| Forging billets, P'gh | 38.00 | 38.00 | 38.00 | 39.00 |
| O.-h. billets, Phila | 38.30 | 38.30 | 38.30 | 39.30 |
| Wire rods, Pittsburgh | 44.00 | 44.00 | 44.00 | 42.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb. | 1.85 | 1.85 | 1.85 | 1.90 |

| **Finished Iron and Steel,** *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Iron bars, Philadelphia | 2.12 | 2.12 | 2.12 | 2.12 |
| Iron bars, Chicago | 2.00 | 2.00 | 2.00 | 2.00 |
| Steel bars, Pittsburgh | 1.85 | 1.85 | 1.85 | 1.85 |
| Steel bars, Chicago | 2.00 | 2.00 | 2.00 | 2.00 |
| Steel bars, New York | 2.19 | 2.19 | 2.19 | 2.19 |
| Tank plates, Pittsburgh | 1.85 | 1.85 | 1.85 | 1.85 |
| Tank plates, Chicago | 2.00 | 2.00 | 2.00 | 2.00 |
| Tank plates, New York | 2.17½ | 2.17½ | 2.17½ | 2.19 |
| Beams, Pittsburgh | 1.85 | 1.85 | 1.85 | 1.80 |
| Beams, Chicago | 2.00 | 2.00 | 2.00 | 2.00 |
| Beams, New York | 2.14½ | 2.14½ | 2.14½ | 2.14 |
| Steel hoops, Pittsburgh | 2.20 | 2.20 | 2.20 | 2.30 |

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

| **Sheets, Nails and Wire,** *Per Lb. to Large Buyers:* | May 1, 1928 Cents | Apr. 24, 1928 Cents | Apr. 3, 1928 Cents | May 3, 1927 Cents |
|---|---|---|---|---|
| Sheets, black, No. 24, P'gh | 2.75 | 2.75 | 2.85 | 2.70 |
| Sheets, black, No. 24, Chicago dist. mill | 2.85 | 2.85 | 3.00 | 2.95 |
| Sheets, galv., No. 24, P'gh | *3.60* | 3.65 | 3.65 | 3.60 |
| Sheets, galv. No. 24, Chicago dist. mill | 3.70 | 3.70 | 3.85 | 3.85 |
| Sheets, blue, 9 & 10, P'gh | 2.00 | 2.00 | 2.10 | 2.15 |
| Sheets, blue, 9 & 10, Chicago dist. mill | 2.15 | 2.15 | 2.20 | 2.35 |
| Wire nails, Pittsburgh | *2.55* | 2.65 | 2.65 | 2.50 |
| Wire nails, Chicago dist. mill | 2.70 | 2.70 | 2.70 | 2.60 |
| Plain wire, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.40 |
| Plain wire, Chicago dist. mill | 2.55 | 2.55 | 2.55 | 2.45 |
| Barbed wire, galv., P'gh | 3.35 | 3.35 | 3.35 | 3.25 |
| Barbed wire, galv., Chicago dist. mill | 3.40 | 3.40 | 3.40 | 3.30 |
| Tin plate, 100 lb. box, P'gh | $5.25 | $5.25 | $5.25 | $5.50 |

| **Old Material,** Per Gross Ton: | | | | |
|---|---|---|---|---|
| Heavy melting steel, P'gh | $15.25 | $15.25 | $15.00 | $15.50 |
| Heavy melting steel, Phila. | 13.50 | 13.50 | 13.50 | 14.50 |
| Heavy melting steel, Ch'go | 13.00 | 13.00 | 12.50 | 12.75 |
| Carwheels, Chicago | 13.50 | 13.50 | 13.50 | 14.25 |
| Carwheels, Philadelphia | 15.50 | 15.50 | 15.50 | 16.00 |
| No. 1 cast, Pittsburgh | 14.50 | 14.50 | 14.50 | 16.00 |
| No. 1 cast, Philadelphia | 16.00 | 16.00 | 16.00 | 17.00 |
| No. 1 cast, Ch'go (net ton) | 14.00 | 14.00 | 14.50 | 16.50 |
| No. 1 RR. wrot, Phila | 15.00 | 15.00 | 15.00 | 16.50 |
| No. 1 RR. wrot, Ch'go (net) | 11.50 | 11.50 | 11.00 | 11.75 |

| **Coke, Connellsville,** Per Net Ton at Oven: | | | | |
|---|---|---|---|---|
| Furnace coke, prompt | $2.60 | $2.60 | $2.60 | $3.00 |
| Foundry coke, prompt | 3.75 | 3.75 | 3.75 | 4.00 |

| **Metals,** *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Lake copper, New York | 14.25 | 14.25 | 14.30 | 13.12½ |
| Electrolytic copper, refinery | *14.00* | 14.12½ | 14.12½ | 12.75 |
| Zinc, St. Louis | **5.85** | 5.82½ | 5.72½ | 6.12½ |
| Zinc, New York | **6.20** | 6.17½ | 6.07½ | 6.47½ |
| Lead, St. Louis | 6.00 | 6.00 | 5.95 | 6.40 |
| Lead, New York | 6.10 | 6.10 | 6.10 | 6.75 |
| Tin (Straits), New York | *51.12½* | 52.62½ | 53.50 | 67.00 |
| Antimony (Asiatic), N. Y. | **10.50** | 10.12½ | 9.50 | 13.00 |

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

# Pittsburgh

## Steel Volume Continues Fairly High, But Prices Lack Strength

PITTSBURGH, May 1.—Viewed strictly from the standpoint of volume of business, the steel market still is making a good showing. There is a constant flow of small orders, and while there is doubt each day as to mill schedules, the business necessary to complete them usually is in before the day is over. Demand for steel is not tapering off as rapidly as might be assumed from some observations. Indeed, if the volume of ordering was about 5 per cent greater than it is, steel purchases now would make a favorable comparison with those of the first three months of the year. In most finished products mills have orders sufficient to maintain rolling operations for at least another month.

Ingot production usually moves up or down in advance of changes in the rate of rolling mill engagement. That is the case now, as there continues to be some tapering in ingot output in the face of sustained activity of finishing mills. In this and nearby districts ingot output is barely 80 per cent of capacity, but except for bar and strip mills there has been little decline as yet in rolling mill operations.

The price situation is a source of discontent among producers and even that is not as bad as it might have been if the steel trade had made no effort to advance the market in the early part of the year. Even if prices recede to the low levels of late last year, and that appears to be the tendency, steel manufacturers at least have had some benefit from the difference between quoted and invoice prices, to say nothing of the savings that have been effected through relatively full engagement of capacity. There is little strength in steel prices, and in most products the explanation seems to be in the fact that steel makers do not seem to be guided by known consumption in gaging production.

Few believe that the automotive industry will continue to take as much steel in the next 90 days as in the past four months, and the attitude of the railroads toward purchases is illustrated by the fact that one large Eastern system in April ordered about 20 per cent in value of its purchases of the same month last year. No strong hopes are held of a recovery in the oil industry.

Valley basic iron is down 50c. a ton from its recent nominal level. Scrap prices are more inclined to go down than up. Continued depression is noted in coal and coke.

**Pig Iron.**—The Valley basic iron market is definitely lower. It develops that on the recent sale of this grade to the American Steel Foundries for its Alliance, Ohio, plant that, while the iron was sold by a furnace outside the Valley having a lower freight rate to Alliance than any of the Valley furnaces, there was a quotation from at least one of the latter of $16.50, furnace. Furthermore, this price still is available, and in light of recent developments the lower price became effective more than a week ago. The price of Valley basic iron in the "Comparison of Prices" table under date of April 24 therefore should have read $16.50 instead of $17. A definite offer of iron by a producer establishes a price quite as fully as a transaction at a stated price. The pig iron mar-

ket as a whole presents little of interest. Consumers under contract are not much concerned about additional supplies, because they are not using iron as freely as they had expected to and the buying is entirely from the spot tonnage buyers, who are paying recent prices on foundry, malleable and Bessemer grades. The Claire furnace of the Reliance Coke & Furnace Co. was blown in May 1 following a five months' period of inactivity. W. P. Snyder & Co. make the April average prices of Valley Bessemer and basic iron $17.50 and $16.70 respectively, compared with $17.50 and $17 respectively in March.

*Prices per gross ton, f.o.b. Valley furnace:*

| | |
|---|---|
| Basic | $16.50 |
| Bessemer | 17.50 |
| Gray forge | 16.75 |
| No. 2 foundry | 17.25 |
| No. 3 foundry | 16.75 |
| Malleable | 17.25 |
| Low phosphorus, copper free | 27.00 |

Freight rate to the Pittsburgh or Cleveland district, $1.76.

**Bolts, Nuts and Rivets.**—The market in these products is more remarkable for its firmness than its activity. Rivets still reflect in demand the liberal specifications in advance of the higher prices effective April 1.

**Ferroalloys.**—Shipments on contracts reflect a little less urgency, in keeping with slightly lower steel works operations, but there has not been much decline in the volume. There has been some talk of an advance of $5 a ton for ferromanganese on last half contracts, but doubt is expressed that steel market conditions will support higher prices in this or any of the other primary materials.

**Semi-Finished Steel.**—Makers of billets, slabs and sheet bars still report a good movement to regular customers at unchanged prices. Open market activity is practically nil. Tin mills are well engaged, but a decline in sheet and strip mill operations points to some tapering off in the demand for steel for those mills. Users of wire rods are too well supplied or have sufficient tonnage still due them on old orders to be much interested in fresh supplies at present prices.

**Alloy Steel Bars.**—Makers comment favorably on the fact that for the first time in several years the market shows some stability and that this is the first quarter in a long time in which they have not had to take business at less than the prices of the previous quarter. The movement to the motor car builders is good, but is not expanding as it was six or eight weeks ago.

**Bars, Plates and Shapes.**—Buying and specifying are at extremely short range, but aside from the worry over mill schedules, manufacturers still find the volume of business fairly satisfactory. What is wanted is usually wanted promptly, and there are instances where promises of delivery of bars in a week have not been good enough to meet the requirement. The mills still have much structural steel to ship, but are less well provided with backlogs in plates, which is the quietest of the three lines, owing to the light demand for railroad cars and for large diameter pipe. Mills here have not been able to do better than 1.85c., base, except for very small lots or otherwise undesirable specifications. But except for tonnage moving on old contracts less than 1.85c. is not being done. Fabricated steel inquiry is not especially active, and few of the shops in this area have as much business as could be handled.

**Rails and Track Supplies.**—Current business is very quiet and the movement from the mills, though good, is at the expense of order books. Small spikes are especially slow and light-section rails drag, owing to the unfavorable coal situation. Prices are steady.

**Wire Products.**—Not much complaint is heard as to the movement of wire products from the mills, but it is chiefly against old and low-priced contracts, because of the large specifications accepted on first quarter contracts. There are not enough new requirements to seriously test present prices, and irregularity and weakness in some districts are the result of efforts by manufacturers to win orders from buyers already well supplied or covered.

**Tubular Goods.**—Fairly good movement of standard-weight pipe hardly makes up for a very light demand for oil country goods, and total pipe mill operations are not more than 60 per cent of capacity. There is much talk of large gas pipe line orders, but they do not appear to be working toward the mills. The best movement in tubing is to the automobile builders.

**Sheets.**—Business as a whole is quieter than it has been, and in some quarters this is ascribed to the weakness of prices, a condition that usually makes buyers timid. Black sheets are definitely as low as 2.75c., base, and while some mills still hold to 2.90c., there has not been much recent business at more than 2.85c., and contracts are being revised to the new level. There is still a quotation of 3.75c., base, on galvanized, but with some makers taking business at 3.60c. and even less on preferential accounts the higher price becomes more of an asking than a sales basis. The market on all grades is back to the low levels of last year and it is doubtful if the mills have profited at all from the advances that have been announced, since they were well filled up when the advances were made and by contract price revisions they now lose any advantage they may have had through bookings at the higher prices. It is said that sheet consumption averages between 75 and 80 per cent of productive capacity, but as mill scheduling seemingly does not recognize such limitations, recurrent price weakness is easily understood.

**Tin Plate.**—Demand for tin plate holds up well, and the American Sheet & Tin Plate Co. found it necessary last week to put on additional mills to get tonnage out as fast as it is required. Its operations last week were 94 per cent of capacity, against 92 per cent the week before. Several of the independent makers still are operating full.

**Cold-Finished Steel Bars and Shafting.**—Orders are coming in steadily and business is regarded as satisfactory, although the individual releases are for smaller tonnages than they were recently. Prices are firm at 2.20c., base Pittsburgh.

**Hot-Rolled Flats.**—Prices appear to be more steadily maintained on the narrow than on wide stock. The

## The Iron Age Composite Prices

### Finished Steel

May 1, 1928, 2.355c. a Lb.

| | |
|---|---|
| One week ago | 2.355c. |
| One month ago | 2.357c. |
| One year ago | 2.339c. |
| 10-year pre-war average | 1.689c. |

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

| | High | | Low | |
|---|---|---|---|---|
| *1928* | 2.364c., | Feb. 14; | 2.314c., | Jan. 3 |
| *1927* | 2.453c., | Jan. 4; | 2.293c., | Oct. 25 |
| *1926* | 2.453c., | Jan. 5; | 2.403c., | May 18 |
| *1925* | 2.560c., | Jan. 6; | 2.396c., | Aug. 18 |
| *1924* | 2.789c., | Jan. 15; | 2.460c., | Oct. 14 |
| *1923* | 2.824c., | Apr. 24; | 2.446c., | Jan. 2 |

### Pig Iron

May 1, 1928, $17.59 a Gross Ton

| | |
|---|---|
| One week ago | $17.67 |
| One month ago | 17.67 |
| One year ago | 19.13 |
| 10-year pre-war average | 15.72 |

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

| | High | | Low | |
|---|---|---|---|---|
| *1928* | $17.75, | Feb. 14; | $17.54, | Jan. 3 |
| *1927* | 19.71, | Jan. 4; | 17.54, | Nov. 1 |
| *1926* | 21.54, | Jan. 5; | 19.46, | July 13 |
| *1925* | 22.50, | Jan. 13; | 18.96, | July 7 |
| *1924* | 22.88, | Feb. 26; | 19.21, | Nov. 3 |
| *1923* | 30.86, | Mar. 20; | 20.77, | Nov. 20 |



SIDE-GUIDE AND GRIPPER

# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

*Soft Steel*

| | Base Per Lb. |
|---|---|
| F.o.b. Pittsburgh mill | 1.85c. to 1.90c. |
| F.o.b. Chicago | 2.00c. |
| Del'd Philadelphia | 2.17c. to 2.22c. |
| Del'd New York | 2.19c. to 2.24c. |
| Del'd Cleveland | 2.04c. to 2.09c. |
| F.o.b. Cleveland | 1.85c. |
| F.o.b. Lackawanna | 1.95c. |
| F.o.b. Birmingham | 2.05c. to 2.15c. |
| C.i.f. Pacific ports | 2.35c. |
| F.o.b. San Francisco mills | 2.35c. to 2.40c. |

*Billet Steel Reinforcing*

| | |
|---|---|
| F.o.b. Pittsburgh mills | 1.95c. to 2.00c. |
| F.o.b. Birmingham | 2.05c. to 2.15c. |

*Rail Steel*

| | |
|---|---|
| F.o.b. mills east of Chicago district | 1.75c. |
| F.o.b. Chicago Heights mill | 1.85c. |

*Iron*

| | |
|---|---|
| Common iron, f.o.b. Chicago | 2.00c. |
| Refined iron, f.o.b. P'gh mills | 2.75c. |
| Common iron, del'd Philadelphia | 2.12c. |
| Common iron, del'd New York | 2.14c. |

## Tank Plates

| | Base Per Lb. |
|---|---|
| F.o.b. Pittsburgh mills | 1.85c. to 1.90c. |
| F.o.b. Chicago | 2.00c. |
| F.o.b. Birmingham | 2.05c. to 2.15c. |
| Del'd Cleveland | 2.04c. to 2.09c. |
| Del'd Philadelphia | 2.10c. to 2.15c. |
| F.o.b. Coatesville | 2.00c. to 2.05c. |
| F.o.b. Sparrows Point | 2.00c. |
| F.o.b. Lackawanna | 1.95c. |
| Del'd New York | 2.17½c. to 2.22½c. |
| C.i.f. Pacific ports | 2.30c. |

## Structural Shapes

| | Base Per Lb. |
|---|---|
| F.o.b. Pittsburgh mills | 1.85c. to 1.90c. |
| F.o.b. Chicago | 2.00c. |
| F.o.b. Birmingham | 2.05c. to 2.15c. |
| F.o.b. Lackawanna | 1.95c. |
| F.o.b. Bethlehem | 2.00c. |
| Del'd Cleveland | 2.04c. to 2.09c. |
| Del'd Philadelphia | 2.12c. to 2.18c. |
| Del'd New York | 2.14½c. to 2.19½c. |
| C.i.f. Pacific ports | 2.35c. |

## Hot-Rolled Flats (Hoops, Bands and Strips)

| | Base Per Lb. |
|---|---|
| Narrower than 3 in., P'gh | 2.20c. to 2.40c. |
| Wider than 3 in. to 6 in., P'gh | 2.05c. to 2.10c. |
| 6 in. and wider, P'gh | *1.80c. to 1.90c. |
| Narrower than 3 in., Chicago | 2.30c. to 2.40c. |
| From 3 to 6 in., Chicago | 2.10c. to 2.20c. |
| 6 in. and wider, Chicago | 2.00c. to 2.10c. |

*Mills follow plate or sheet prices according to gage on wider than 12 in.

## Cold-Finished Steel

| | Base Per Lb. |
|---|---|
| Bars, f.o.b. Pittsburgh mills | 2.20c. |
| Bars, f.o.b. Chicago | 2.20c. |
| Bars, Cleveland | 2.25c. |
| Shafting, ground, f.o.b. mill | *2.45c. to 2.90c. |
| Strips, under 12 in., 1 up to 3 tons, P'gh | 3.00c. to 3.15c. |
| Strips, under 12 in., 1 up to 3 tons, Cleveland | 3.00c. to 3.15c. |
| Strips, under 12 in., 1 up to 3 tons, del'd Chicago | 3.30c. to 3.45c. |
| Strips, under 12 in., 1 up to 3 tons, Worcester | 3.15c. to 3.30c. |

*According to size.

## Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

| | Base Per Keg |
|---|---|
| Wire nails | $2.55 to $2.65 |
| Galvanized nails | 4.55 to 4.65 |
| Galvanized staples | 3.25 to 3.35 |
| Polished staples | 3.00 to 3.10 |
| Cement coated nails | 2.55 to 2.65 |

| | Base Per 100 Lb. |
|---|---|
| Bright plain wire, No. 9 gage | $2.50 |
| Annealed fence wire | 2.65 |
| Spring wire | 3.50 |
| Galv'd wire, No. 9 | 3.10 |
| Barbed wire, galv'd | 3.35 |
| Barbed wire, painted | 3.10 |

**Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.**

*Woven Wire Fence*

*Base to Retailers Per Net Ton*

| | |
|---|---|
| F.o.b. Pittsburgh | $65.00 |
| F.o.b. Cleveland | 65.00 |
| F.o.b. Anderson, Ind. | 66.00 |
| F.o.b. Chicago district mills | 67.00 |
| F.o.b. Duluth | 68.00 |
| F.o.b. Birmingham | 68.00 |

## Sheets

*Blue Annealed*

| | Base Per Lb. |
|---|---|
| Nos. 9 and 10, f.o.b. P'gh | 2.00c. to 2.10c. |
| Nos. 9 and 10, f.o.b. Chicago dist. mill | 2.15c. to 2.30c. |
| Nos. 9 and 10, del'd Cleveland | 2.09c. to 2.19c. |
| Nos. 9 and 10, del'd Philadelphia | 2.32c. to 2.52c. |
| Nos. 9 and 10, f.o.b. Birmingham | 2.25c. to 2.30c. |

*Box Annealed, One Pass Cold Rolled*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 2.75c. to 2.90c. |
| No. 24, f.o.b. Chicago dist. mill | 2.85c. to 3.00c. |
| No. 24, del'd Cleveland | 2.84c. to 2.94c. |
| No. 24, del'd Philadelphia | 3.07c. to 3.22c. |
| No. 24, f.o.b. Birmingham | 3.05c. |

*Metal Furniture Sheets*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh, A grade | 3.90c. to 4.00c. |
| No. 24, f.o.b. Pittsburgh, B grade | 3.70c. to 3.80c. |

*Galvanized*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 3.60c. to 3.75c. |
| No. 24, f.o.b. Chicago dist. mill | 3.70c. to 3.85c. |
| No. 24, del'd Cleveland | 3.64c. to 3.84c. |
| No. 24, del'd Philadelphia | 3.92c. to 4.07c. |
| No. 24, f.o.b. Birmingham | 3.90c. |

*Tin Mill Black Plate*

| | |
|---|---|
| No. 28, f.o.b. Pittsburgh | 2.90c. to 3.00c. |
| No. 28, f.o.b. Chicago dist. mill | 3.10c. |

*Automobile Body Sheets*

| | |
|---|---|
| No. 20, f.o.b. Pittsburgh | 4.00c. |

*Long Ternes*

| | |
|---|---|
| No. 24, 8-lb. coating, f.o.b. mill primes | 4.10c. |

## Tin Plate

| | Per Base Box |
|---|---|
| Standard cokes, f.o.b. P'gh district mills | $5.25 |
| Standard cokes, f.o.b. Gary | 5.35 |

## Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating I.C. $11.20 | 25-lb. coating I.C. $16.70 |
| 15-lb. coating I.C. 14.00 | 30-lb. coating I.C. 17.75 |
| 20-lb. coating I.C. 15.30 | 40-lb. coating I.C. 19.85 |

## Alloy Steel Bars

(F.o.b. maker's mill.)

| S.A.E. Series Numbers | | Per 100 Lb. |
|---|---|---|
| 2000 | (½% Nickel) | $2.90 |
| 2100 | (1½% Nickel) | 3.20 |
| 2300 | (3½% Nickel) | 4.15 |
| 2500 | (5% Nickel) | 4.90 |
| 3100 | Nickel Chromium | 3.20 |
| 3200 | Nickel Chromium | 3.65 |
| 3300 | Nickel Chromium | 6.45 |
| 3400 | Nickel Chromium | 5.85 |
| 4100 | Chromium Molybdenum (0.15 to 0.25 Molybdenum) | 3.15 |
| 4100 | Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 3.35 |
| 4600 | Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) | 3.70 |
| 5100 | Chromium Steel (0.60 to 0.90 Chrome) | 3.00 |
| 5100 | Chromium Steel (0.80 to 1.10 Chrome) | 3.10 |
| 5100 | Chromium Spring Steel | 2.85 |
| 6100 | Chromium Vanadium Bars | 3.85 |
| 6100 | Chromium Vanadium Spring Steel | 3.60 |
| 9250 | Silicon Manganese Spring Steel | 2.90 |
| | Chrome Nickel Vanadium | 4.15 |
| | Carbon Vanadium | 3.60 |

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

## Rails

| | Per Gross Ton |
|---|---|
| Standard, f.o.b. mill | $43.00 |
| Light (from billets), f.o.b. mill | 36.00 |
| Light (from rail steel), f.o.b. mill | 34.00 |
| Light (from billets), f.o.b. Ch'go mill | 36.00 |

## Track Equipment

| | Base Per 100 Lb. |
|---|---|
| Spikes, ⅝ in. and larger | $2.80 |
| Spikes, ½ in. and smaller | 2.80 |
| Spikes, boat and barge | 3.00 |
| Tie plates, steel | 2.15 |
| Angle bars | 2.75 |
| Track bolts, to steam railroads | $3.80 to 4.00 |
| Track bolts, to jobbers, all sizes, per 100 count | 70 per cent off list |

## Welded Pipe

**Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills**

*Butt Weld*

| Steel | | | Iron | | |
|---|---|---|---|---|---|
| Inches | Black | Galv. | Inches | Black | Galv. |
| ⅛ | 45 | 19½ | ¼ to ⅜ | +11 | +39 |
| ¼ to ⅜ | 51 | 25½ | ½ | 22 | 2 |
| ½ | 56 | 42½ | ¾ | 28 | 11 |
| ¾ | 60 | 48½ | 1 to 1½ | 30 | 13 |
| 1 to 3 | 62 | 50½ | | | |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 55 | 43½ | 2 | 23 | 1 |
| 2½ to 6 | 59 | 47½ | 2½ | 26 | 11 |
| 7 and 8 | 56 | 43½ | 3 to 6 | 28 | 13 |
| 9 and 10 | 54 | 41½ | 7 to 12 | 26 | 11 |
| 11 and 12 | 53 | 40½ | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | 41 | 24½ | ¼ to ⅜ | +19 | +54 |
| ¼ to ⅜ | 47 | 30½ | ½ | 21 | 17 |
| ½ | 53 | 42½ | ¾ | 28 | 12 |
| ¾ | 58 | 47½ | 1 to 1½ | 30 | 14 |
| 1 to 1½ | 60 | 49½ | | | |
| 2 to 3 | 61 | 50½ | | | |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 53 | 42½ | 2 | 23 | 9 |
| 2½ to 4 | 57 | 46½ | 2½ to 4 | 29 | 15 |
| 4½ to 6 | 56 | 45½ | 4½ to 6 | 28 | 14 |
| 7 to 8 | 52 | 39½ | 7 to 8 | 21 | 15 |
| 9 and 10 | 45 | 32½ | 9 to 12 | 16 | 2 |
| 11 and 12 | 44 | 31½ | | | |

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

**Base Discounts, f.o.b. Pittsburgh**

| Lap Welded Steel | | Charcoal Iron | |
|---|---|---|---|
| 2 to 2¼ in. | 27 | 1½ in. | +18 |
| 2½ to 2¾ in. | 37 | 1¾ to 1⅞ in. | + 8 |
| 3 in. | 40 | 2 to 2¼ in. | — 2 |
| 3¼ to 3¾ in. | 42½ | 2½ to 3 in. | — 7 |
| 4 to 13 in. | 46 | 3¼ to 4½ in. | — 9 |

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

*Standard Commercial Seamless Boiler Tubes*

*Cold Drawn*

| | | | |
|---|---|---|---|
| 1 in. | 60 | 3 in. | 45 |
| 1¼ to 1½ in. | 52 | 3½ to 3½ in. | 47 |
| 1¾ in. | 36 | 4 in. | 50 |
| 2 to 2¼ in. | 31 | 4½, 5 and 6 in. | 45 |
| 2½ to 2¾ in. | 39 | | |

*Hot Rolled*

| | | | |
|---|---|---|---|
| 2 and 2¼ in. | 37 | 3¼ and 3½ in. | 53 |
| 2½ and 2¾ in. | 45 | 4 in. | 56 |
| 3 in. | 51 | 4½, 5 and 6 in. | 51 |

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

| | Per Cent Off List |
|---|---|
| Carbon, 0.10% to 0.30%, base | 55 |
| Carbon, 0.30% to 0.40%, base | 50 |

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.



SIDE-GUIDE AND GRIPPER

latter usually is in competition with other flat products, and the present is no exception. Some consumers take both wide and narrow stock and usually find some mills willing to make an average price that is below the regular market on the narrow widths. The outside prices quoted refer chiefly to small lots of high carbon steel.

**Cold-Rolled Strips.**—Tonnage buyers are not finding it hard to get accommodation at 2.75c. for lots of 3 tons or more and 2.90c. is chiefly a price to small buyers.

**Warehouse Business.**—Demand is somewhat sporadic, but sales are averaging fairly large, although most merchants find them to be running a little behind those at this time last year. The weakness in mill prices of sheets has led to an abandonment of resale quotations predicated on 2.90c., base, for black and 3.75c., base, for galvanized. The regular price schedule is well maintained on cold-finished steel bars, spikes and bolts, nuts and rivets, but warehouses find it hard to get full quotations on nails owing to jobber competition.

**Coke and Coal.**—The market continues dull and easy, except in slack coal, which is not being produced very heavily on account of a limited demand for screened coal and is bringing good prices because of its scarcity. A Valley blast furnace which resumed today is running on by-product oven coke furnished by a Youngstown district steel company. The market for beehive oven furnace coke is very limited, and such demand as there is comes from other than pig iron producers. Prices are weak at last week's levels. Spot foundry coke goes at as low as $3.50 per net ton at ovens for machine-pushed coke, but hand-drawn coke still is bringing $3.75 to $4.25 for good brands, and as much as $4.75 for the so-called premium brands. The coal market is very slow, and the prospect of improvement is dimmed by uncertainty as to whether the Southern or Northern fields are to get the bulk of the Lake business. Southern shippers are in doubt about the permanence of the rate reduction and are inserting in contracts a clause which provides for the payment of the extra 20c. a ton by buyers in case the Supreme Court upsets the lower court's decision.

**Old Material.**—Interest in the market still centers around heavy melting steel, which in recent weeks has fluctuated more widely in price than other grades of scrap. One good-sized sale into consumption was made in the week at about $15.75, but on small lots melters generally are not offering more than $15.25 and are getting some material at that price, although $15.50 has been paid by dealers having short orders at $16. The ruling price at most points of delivery in the district is $15.25. Nervousness among dealers has subsided, and lower prices seem likely on the railroad scrap lists this month. This month's Baltimore & Ohio list has 17,860 tons, and the Pennsylvania Railroad list has more than double that amount. Compressed sheet scrap still is scarce, with dealers offering $15 on short orders, but mills are not able to buy under $15.50.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

| | |
|---|---|
| **Basic Open-Hearth Furnace Grades:** | |
| No. 1 heavy melting steel | $15.25 to $15.75 |
| Scrap rails | 15.00 to 15.25 |
| Compressed sheet steel | 15.00 to 15.50 |
| Bundled sheets, sides and ends | 14.00 to 14.50 |
| Cast iron carwheels | 14.50 to 15.00 |
| Sheet bar crops, ordinary | 15.50 to 16.00 |
| Heavy breakable cast | 13.00 to 13.50 |
| No. 2 railroad wrought | 15.50 to 16.00 |
| Heavy steel axle turnings | 13.00 to 13.50 |
| Machine shop turnings | 10.25 to 10.50 |
| **Acid Open-Hearth Furnace Grades:** | |
| Railroad knuckles and couplers | 16.50 to 17.00 |
| Railroad coil and leaf springs | 16.50 to 17.00 |
| Rolled steel wheels | 16.50 to 17.00 |
| Low phosphorus billet and bloom ends | 18.50 to 19.00 |
| Low phosphorus, mill plate | 17.50 to 18.00 |
| Low phosphorus, light grade | 16.50 to 17.00 |
| Low phosphorus sheet bar crops | 17.50 to 18.00 |
| Heavy steel axle turnings | 13.00 to 13.50 |
| **Electric Furnace Grades:** | |
| Low phosphorus punchings | 16.50 to 17.00 |
| Heavy steel axle turnings | 13.00 to 13.50 |
| **Blast Furnace Grades:** | |
| Short shoveling steel turnings | 11.00 to 11.25 |
| Short mixed borings and turnings | 11.00 to 11.25 |
| Cast iron borings | 11.00 to 11.25 |
| No. 2 busheling | 10.50 to 11.00 |
| **Rolling Mill Grades:** | |
| Steel car axles | 18.00 to 19.00 |
| No. 1 railroad wrought | 11.00 to 11.50 |
| Sheet bar crops | 17.00 to 17.50 |
| **Cupola Grades:** | |
| No. 1 cast | 14.50 to 15.00 |
| Rails 3 ft. and under | 15.50 to 16.00 |
| **Malleable Grades:** | |
| Railroad | 15.50 to 16.00 |
| Industrial | 15.00 to 15.50 |
| Agricultural | 14.50 to 15.00 |

**Warehouse Prices, f.o.b. Pittsburgh**

| | Base per Lb. |
|---|---|
| Plates | 3.00c. |
| Structural shapes | 3.00c. |
| Soft steel bars and small shapes | 2.90c. |
| Reinforcing steel bars | 2.75c. |
| Cold-finished and screw stock— | |
| Rounds and hexagons | 3.60c. |
| Squares and flats | 4.10c. |
| Bands | 3.60c. |
| Hoops | 4.00c. to 4.50c. |
| Black sheets (No. 24 gage), 25 or more bundles | 3.65c. |
| Galvanized sheets (No. 24 gage), 25 or more bundles | 4.50c. |
| Blue annealed sheets (No. 10 gage), 25 or more sheets | 3.10c. |
| Galvanized corrugated sheets (No. 28 gage), per square | $4.39 |
| Spikes, large | 3.40c. |
| Small | 3.80c. to 5.25c. |
| Boat | 3.80c. |
| Track bolts, all sizes, per 100 count, | 60 per cent off list |
| Machine bolts, per 100 count | 60 per cent off list |
| Carriage bolts, per 100 count | 60 per cent off list |
| Nuts, all styles, per 100 count | 60 per cent off list |
| Large rivets, base per 100 lb | $3.50 |
| Wire, black soft annealed, base per 100 lb | $3.00 to 3.10 |
| Wire, galvanized soft, base per 100 lb. | 3.00 to 3.10 |
| Common wire nails, per keg | 3.00 |
| Cement coated nails, per keg | 3.05 |

## Result of Operation of New Blast Furnace

After something more than a year's operation, results for six recent months on the Betty furnace of the Central Alloy Steel Corporation have been tabulated by Freyn Engineering Co., Chicago, designer of the furnace. Over that period the average daily production of iron has been 725 gross tons.

For each ton of iron the charge has included an average of 3372 lb. of ore, 396 lb. of scrap and 405 lb. of sinter. The yield on the entire charge is reported at 52.01 per cent. Coke was 1752 lb. gross and 1734 lb. net, per ton of iron. The blast was at an average rate of 45,000 cu. ft. a minute. Five-eighths of the ore charged came from the Mesabi Range, the remainder being Old Range ore.

About 1050 lb. of slag was made for each ton of iron, and 867 lb. of limestone was used. Lime in the slag averaged 40.98 per cent, with silica 37.18 per cent and alumina 12.63 per cent.

Blast temperature is carried usually at 1200 deg. Fahr., being regulated by Leeds-Northrup heat control. It can be run up to 1700 deg. if required. Stoves are changed every 2 hr., being on gas 6 hr. and on blast 2 hr. The upper limit on exit temperature is set at 600 deg., at which point gas is shut off.

As the big bell is interlocked with two stock-line recorders, the height of stock in the furnace is gaged every time the bell is lowered.

Three mixer-type Treadwell ladles, 150 tons each, are used to carry the iron to the steel plant. These require relining after handling about 50,000 tons. As there is no mixer at the steel plant, off-heats and surplus iron above open-hearth requirements are poured in the pig machine.

Nicholas & Miller, McCormick Building, Chicago, dealers in pig iron and ferroalloys, have been appointed Chicago sales representatives, succeeding David Evans, for the products of the Sloss-Sheffield Steel & Iron Co., Birmingham.

# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

**F.o.b. Pittsburgh or Youngstown**

### Billets and Blooms

| | *Per Gross Ton* |
|---|---|
| Rerolling, 4-in. and over | $33.00 |
| Rerolling, under 4-in. to and including 1¾-in. | $33.50 to 34.00 |
| Forging, ordinary | 38.00 |
| Forging, guaranteed | 43.00 |

### Sheet Bars

| | *Per Gross Ton* |
|---|---|
| Open-hearth or Bessemer | $34.00 |

### Slabs

| | *Per Gross Ton* |
|---|---|
| 8 in. x 2 in. and larger | $33.00 |
| Smaller than 8 in. x 2 in. | 34.00 |

### Skelp

| | *Per Lb.* |
|---|---|
| Grooved | 1.85c. to 1.90c. |
| Sheared | 1.85c. to 1.90c. |
| Universal | 1.85c. to 1.90c. |

### Wire Rods

| | *Per Gross Ton* |
|---|---|
| *Common soft, base | $44.00 |
| Screw stock | $5.00 per ton over base |

*Chicago mill base is $45. Cleveland mill base, $44.

## Prices of Raw Material

### Ores

*Lake Superior Ores. Delivered Lower Lake Ports*

| | *Per Gross Ton* |
|---|---|
| Old range Bessemer, 51.50% iron | $4.55 |
| Old range non-Bessemer, 51.50% iron | 4.40 |
| Mesabi Bessemer, 51.50% iron | 4.40 |
| Mesabi non-Bessemer, 51.50% iron | 4.25 |
| High phosphorus, 51.50% iron | 4.15 |

| *Foreign Ore, c.i.f. Philadelphia or Baltimore* | *Per Unit* |
|---|---|
| Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria | 10.00c. |
| Iron ore, Swedish, average 66% iron, | 9.25c. to 9.50c. |
| Manganese ore, washed, 52% manganese, from the Caucasus | 39c. |
| Manganese ore, Brazilian, African or Indian, basis 50% | 38c. to 39c. |
| Tungsten ore, high grade, per unit, in 60% concentrates | $10.50 to $10.75 |

| | *Per Gross Ton* |
|---|---|
| Chrome ore, 45 to 50% $Cr_2O_3$, crude, c.i.f. Atlantic seaboard | $22.00 to $24.00 |

| | *Per Lb.* |
|---|---|
| Molybdenum ore, 85% concentrates of $MoS_2$, delivered | 50c. to 55c. |

### Coke

| | *Per Net Ton* |
|---|---|
| Furnace, f.o.b. Connellsville prompt | $2.60 to $2.75 |
| Foundry, f.o.b. Connellsville prompt | 3.50 to 4.25 |
| Foundry, by-product, Ch'go ovens | 9.00 |
| Foundry, by-product, New England, del'd | 11.00 |
| Foundry, by-product, Newark or Jersey City, delivered | 9.00 to 9.40 |
| Foundry, Birmingham | 5.00 |
| Foundry, by-product, St. Louis | 9.75 |

### Coal

| | *Per Net Ton* |
|---|---|
| Mine run steam coal, f.o.b. W. Pa. mines | $1.40 to $1.80 |
| Mine run coking coal, f.o.b. W. Pa. mines | 1.50 to 1.75 |
| Gas coal, ¾-in., f.o.b. Pa. mines | 2.00 to 2.10 |
| Mine run gas coal, f.o.b. Pa. mines | 1.75 to 1.90 |
| Steam slack, f.o.b. W. Pa. mines | 1.15 to 1.20 |
| Gas slack, f.o.b. W. Pa. mines | 1.20 to 1.35 |

### Ferromanganese

| | *Per Gross Ton* |
|---|---|
| Domestic, 80%, furnace or seab'd | $100.00 |
| Foreign, 80%, Atlantic or Gulf port, duty paid | 100.00 |

### Spiegeleisen

| | *Per Gross Ton Furnace* |
|---|---|
| Domestic, 19 to 21% | $31.00 to $32.00 |
| Domestic, 16 to 19% | 29.00 |

### Electric Ferrosilicon

| | *Per Gross Ton Delivered* |
|---|---|
| 50% | $83.50 to $88.50 |
| 75% | 130.00 to 140.00 |

| | *Per Gross Ton Furnace* | | *Per Gross Ton Furnace* |
|---|---|---|---|
| 10% | $35.00 | 12% | $39.00 |
| 11% | 37.00 | 14 to 16% | 45.00 |

### Bessemer Ferrosilicon

**F.o.b. Jackson County, Ohio, Furnace**

| | *Per Gross Ton* | | *Per Gross Ton* |
|---|---|---|---|
| 10% | $30.00 | 12% | $34.00 |
| 11% | 32.00 | | |

### Silvery Iron

**F.o.b. Jackson County, Ohio, Furnace**

| | *Per Gross Ton* | | *Per Gross Ton* |
|---|---|---|---|
| 6% | $23.00 | 10% | $28.00 |
| 7% | 24.00 | 11% | 30.00 |
| 8% | 25.00 | 12% | 32.00 |
| 9% | 26.00 | | |

### Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd ..... 92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads ..... $200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton ..... $91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton ..... $122.50

### Fluxes and Refractories

#### Fluorspar

| | *Per Net Ton* |
|---|---|
| Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines | $16.00 |
| No. 2 lump, Illinois and Kentucky mines | $20.00 |
| Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid | $16.00 |
| Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines | $32.50 |

#### Fire Clay

| | *Per 1000 f.o.b. Works* | |
|---|---|---|
| | First Quality | Second Quality |
| Pennsylvania | $43.00 to $46.00 | $35.00 to $38.00 |
| Maryland | 43.00 to 46.00 | 35.00 to 38.00 |
| New Jersey | 50.00 to 65.00 | ——— |
| Ohio | 43.00 to 46.00 | 35.00 to 38.00 |
| Kentucky | 43.00 to 46.00 | 35.00 to 38.00 |
| Missouri | 43.00 to 46.00 | 35.00 to 38.00 |
| Illinois | 43.00 to 46.00 | 35.00 to 38.00 |
| Ground fire clay, per ton | 7.00 | |

#### Silica Brick

| | *Per 1000 f.o.b. Works* |
|---|---|
| Pennsylvania | $43.00 |
| Chicago | 52.00 |
| Birmingham | 50.00 |
| Silica clay, per ton | $8.50 to 10.00 |

#### Magnesite Brick

| | *Per Net Ton* |
|---|---|
| Standard sizes, f.o.b. Baltimore and Chester, Pa. | $65.00 |
| Grain magnesite, f.o.b. Baltimore and Chester, Pa. | 40.00 |

#### Chrome Brick

| | *Per Net Ton* |
|---|---|
| Standard size | $45.00 |

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

**Per 100 Pieces**

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

| | *Per Cent Off List* |
|---|---|
| †Machine bolts | 70 |
| †Carriage bolts | 70 |
| Lag bolts | 70 |
| Plow bolts, Nos. 1, 2, 3 and 7 heads | 70 |
| Hot-pressed nuts, blank or tapped, square | 70 |
| Hot-pressed nuts, blank or tapped, hexagons | 70 |
| C.p.c. and t. square or hex. nuts, blank or tapped | 70 |
| Washers* | 6.75c. to 6.50c. per lb. off list |

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

### Bolts and Nuts

| | *Per Cent Off List* |
|---|---|
| Semi-finished hexagon nuts | 70 |
| Semi-finished hexagon castellated nuts, S.A.E. | 70 |
| Stove bolts in packages, Pittsburgh | 80, 10 and 2½ |
| Stove bolts in packages, Chicago | 75, 20, 10 and 5 |
| Stove bolts in bulk, Pittsburgh | 80, 10 and 5 |
| Stove bolts in bulk, Chicago | 75, 20, 10, 5 and 2½ |
| Tire bolts | 60, 5 and 5 |

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

### Large Rivets

(½-In. and Larger)

| | *Base per 100 Lb.* |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $2.90 |
| F.o.b. Chicago | 3.00 |

### Small Rivets

(7/16-In. and Smaller)

| | *Per Cent Off List* |
|---|---|
| F.o.b. Pittsburgh | 70 and 10 to 70 |
| F.o.b. Cleveland | 70 and 10 to 70 |
| F.o.b. Chicago | 70 and 10 to 70 |

### Cap and Set Screws

(Freight allowed to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

| | *Per Cent Off List* |
|---|---|
| Milled cap screws | 80, 10 and 10 |
| Milled standard set screws, case hardened, | 80 and 10 |
| Milled headless set screws, cut thread | 80 |
| Upset hex. head cap screws, U.S.S. thread, | 85 and 5 |
| Upset hex. cap screws, S.A.E. thread | 85 and 5 |
| Upset set screws | 80, 10 and 10 |
| Milled studs | 70 and 5 |

# Chicago

## Steel Volume Holds Though Orders Are Smaller—Ingot Output at 95 Per Cent

CHICAGO, May 1.—Although steel buyers are showing greater caution and are ordering in smaller quantities to keep stocks at a point close to immediate needs, the total volume is again running into a large tonnage. Sales and specifications in the last few days have made a sharp recovery, and purchases have been only a shade under shipments. However, most of the current orders are for lots smaller than were being ordered a month or so ago.

In production, this district continues to give account of itself, the average rate of operation at the beginning of May being 95 per cent of ingot capacity. Some mills are sufficiently well scheduled so that deliveries in less than four to six weeks are not being promised. The leading producer has 20 blast furnaces in operation, and the total number of active furnaces in the district is 28 out of 36. A merchant furnace was blown out on April 26.

A continued high rate of activity among some of the manufacturing lines which draw heavily upon Chicago steel mills for materials is indicated by latest reports. Road machinery and excavating equipment manufacturers are busy, tractor plants are behind on orders, assuring capacity production for some time to come, and an unusually early start in the demand for harvesting machinery promises to hold farm machinery production above the seasonal drop that is generally expected by the end of May. In addition to the demands from these sources, the production of standard-section rails is steady and large, while the same holds true of track supplies, makers finding it difficult to meet the shipping requirements in the latter products.

**Pig Iron.**—Plans are under way to blow out a merchant stack in the next 10 days. This unit is in need of repairs and improvements will be made while it is down. For several months local producers have held production below shipments, affording an opportunity to liquidate stocks. The fact that this stack is going out does not reflect a lower melt, because stocks will be drawn on more liberally to meet the demand, which is steady. More interest is being shown in third quarter iron, and a fair portion of current buying is for delivery overlapping the second and third quarters. A Milwaukee user is in the market for 1500 tons of Northern foundry iron. A melter in this district will take 700 tons of 14 per cent silvery iron. Northern iron is steady at $18.50 per gross ton, Chicago. The first cargo of Buffalo iron to come by water is expected by the end of next week. No change is noted in the silvery iron market.

*Prices per gross ton at Chicago:*

| | |
|---|---|
| Northern No. 2 foundry, sil. 1.75 to 2.25 | $18.50 |
| N'th'n No. 1 fdy., sil. 2.25 to 2.75 | 19.00 |
| Malleable, not over 2.25 sil. | 18.50 |
| High phosphorus | 18.50 |
| Lake Superior charcoal, averaging, sil. 1.50 | 27.04 |
| Southern No. 2 fdy. (all rail) | 22.01 |
| Southern No. 2 (barge and rail) | 21.18 |
| Low phos., sil. 1 to 2 per cent, copper free | $28.50 to 29.00 |
| Silvery, sil. 8 per cent | 29.79 |
| Bessemer ferrosilicon, 14 to 15 per cent | 46.79 |

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferroalloys.**—This market is quiet except for occasional inquiries for small lots for immediate delivery. Prices are steady.

*Prices delivered Chicago:* 80 per cent ferromanganese, $107.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $38.76 to $39.76.

**Plates.**—Demand for plate mill products in this district is steady, and prices in and near Chicago are unchanged at 2c. Although car building shops are not engaged at capacity, specifications issued by them reach mills in a fairly uniform flow, helping toward more satisfactory rolling schedules in view of the fact that many small consumers are buying at extremely close range and in small lots. The outlook for new business in railroad cars is not promising for the immediate future, but it is reported that several sizable inquiries are in the making. The Rock Island has ordered 500 underframes from the Pennsylvania Car Co. for delivery at its Armourdale, Kan., shops. The only other purchase of note was 250 underframes by the St. Louis-San Francisco from the Virginia Bridge & Iron Co. There is little new inquiry. For several weeks oil storage tank makers have held out of the market and there is nothing in sight from them at this time. Reports are current that consumption of petroleum and its by-products is catching up with output, thus bringing to the fore the impression in some directions that new tank construction has already passed the peak. Specifications for plates, bolstered by a substantial flow of business from the general manufacturing trade, are about equal to shipments.

*Mill prices on plates per lb.:* 2.00c., base Chicago.

**Structural Material.**—This market is quiet in the immediate Chicago territory. Local fabricators are now being offered an opportunity to bid on a number of small tonnage jobs, which, if placed, will round out shop schedules. No change is noted in prices for fabricated steel, the general level being somewhere near the low point of the year. It is reported that the Foshay Tower Building, Minneapolis, Minn., requiring 2000 tons, has been awarded to the Minneapolis Steel & Machinery Co. The Rochester Bridge Co. has taken 3500 tons for additions to several of the Deere & Co. plants. Optimism prevails in Milwaukee, where it is reported that the largest building program in 10 years is getting under way. Close to 6000 tons will be required for a court house in that city.

*Mill prices on plain material per lb.:* 2.00c., base, Chicago.

**Bars.**—Reversing market tendencies of a week ago, sales in mild steel bars have turned up sharply, the total for the week being a shade higher than shipments in the same period. The demand is well diversified as to classification of consumers. It is noticeable, however, that buyers are using greater caution in placing orders, and it is evident that there is an undercurrent of doubt as to consumptive requirements in the near future. Specifications from agricultural machinery manufacturers are steady. Tractor plants report that there will be no seasonal letdown in production for the reason that they cannot hope to catch up with back orders. A note of encouragement comes from harvesting machinery builders, who find an unusually large and early demand for their products. Mild steel bar prices are steady at 2c., Chicago. Producers of iron bars have the largest backlogs in over a year. Shipments are a trifle heavier and prices are firm at 2c., Chicago. Although there has been some readjustment of production in several automobile manufacturing plants, the general level of steel demand by that industry has changed but little and alloy bar mills report an undiminished volume of specifications and steady output. New orders and specifications for hard steel bars are a shade heavier than production, but the margin is not wide enough so that the hours of double-turn operations of the Chicago Heights mills can be lengthened. April hard steel bar shipments topped those in March, and producers continue to reduce stocks on hand. Barn equipment manufacturers have satisfied the bulk of spring customers, and operations are pointing downward in that industry. Prices of rail steel bars are steady at 1.85c., Chicago Heights.

*Mill prices per lb.:* Soft steel bars, 2.00c. base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

**Wire Products.**—Little change is noted in the wire market. Jobbers in the Northwest report an active business, and shipments for the first four months of 1928 are equal to the first eight months of last year. Orders from the South are in good volume, but there is a decided slackening in the jobbing trade in the central Mississippi River Valley. Mill shipments of nails are small. Nails are quoted $2.75, base, per keg in Chicago, while in outlying district $2.50 is still a common quotation. Mill output stands between 65 and 70 per cent of capacity.

**Rails and Track Supplies.**—From the viewpoint of new business, this market is quiet. Several small Western railroads are now inquiring for standard-section rails, the total being close to 4000 tons. Mill bookings in track supplies total 3500 tons, but fresh inquiry in these commodities is lacking. Sales of light rails are in carload lots. Rail mills in this district are operating at 90 per cent of capacity, and accessory units are producing on a proportionate basis.

*Prices f.o.b. mill, per gross ton:* Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

**Sheets.**—Disturbances in prices noted a week ago are still troubling the sheet market in practically all outlying territory. Competitors in districts eastward are freely taking business at lower prices than have been quoted by local producers, and there is now the added intimation that cold-rolled strip will offer keener competition to producers of blue annealed sheets. Local mills are operating on a hand-to-mouth basis, and output will not average above 70 per cent of capacity. Orders on hand at mills afford schedules that often are not more than four days in advance. Orders from the Northwest are disappointingly small. Buyers, realizing that sales pressure is being exerted by producers, are inclined to await changes in prices that may come. Individual orders are small and for prompt shipment.

*Base prices per lb., delivered from mill in Chicago:* No. 24 black, 2.90c. to 3.05c.; No. 24 galvanized, 3.75c. to 3.90c.; No. 10 blue annealed, 2.20c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

**Cold-Rolled Strip.**—Specifications for this commodity are equal to production and prices are steady.

**Hot-Rolled Strip.**—Demand for hot-rolled strip eased off late last week, but has more recently improved somewhat. Prices in the narrow widths have dropped to lower levels. Quotations are as follows: Narrower than 3-in., 2.30c. to 2.40c. per lb., base; 3 to 6-in. wide, 2.10c. to 2.20c.

**Cast Iron Pipe.**—Demand for cast iron pipe is sluggish in this district. The general feeling in the trade is that preparatory plans for pipe-laying programs are not as far advanced as is usually the case at this time of the year. Public utilities are taking only small quantities, and the railroads and contractors are buying little. It is reported that Detroit has taken no action on its recent inquiry. The low bid entered there is on 3000 tons of foreign-made pipe, and the price is about $1 per ton below that of the nearest bid by an American pipe manufacturer. Royal Oak, Mich., has awarded 200 tons of 6-in. pipe to the Detroit Lead & Pipe Co. at $36.42, delivered. The freight from Birmingham is $7.92. The National Cast Iron Pipe Co. has taken 200 tons of cast iron pipe for Kirkland, Ill.

*Prices per net ton, delivered Chicago:* Water pipe, 6-in. and over, $36.20 to $39.20; 4-in., $40.20 to $43.20; Class A and gas pipe, $4 extra.

### Warehouse Prices, f.o.b. Chicago

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.10c. |
| Soft steel bars | 3.00c. |
| Reinforcing bars, billet steel | 2.15c. to 2.40c. |
| Cold-finished steel bars and shafting— | |
| Rounds and hexagons | 3.60c. |
| Flats and squares | 4.10c. |
| Bands | 3.65c. |
| Hoops | 4.15c. |
| Black sheets (No. 24) | 3.95c. |
| Galvanized sheets (No. 24) | 4.80c. |
| Blue annealed sheets (No. 10) | 3.50c. |
| Spikes, standard railroad | 3.55c. |
| Track bolts | 4.55c. |
| Rivets, structural | 3.60c. |
| Rivets, boiler | 3.60c. |
| | **Per Cent Off List** |
| Machine bolts | 60 |
| Carriage bolts | 60 |
| Coach or lag screws | 60 |
| Hot-pressed nuts, squares, tapped or blank | 60 |
| Hot-pressed nuts, hexagons, tapped or blank | 60 |
| No. 8 black annealed wire, per 100 lb | $3.30 |
| Common wire nails, base per keg | 3.10 |
| Cement coated nails, base per keg | 3.10 |

**Reinforcing Bars.**—Large tonnage awards of hard steel and billet steel bars are about equal. For many weeks the rail steel commodity has led by a comfortable margin. Close to 500 tons of soft steel reinforcing bars have been purchased for the Woolworth Building, Chicago, and 400 tons of rail steel bars have been taken for a local engraving plant. Evidence is at hand that awards may soon run heavier. Outdoor construction weather is now more favorable and buyers are offered the additional inducement that prices are at the low point of the spring months. Shop operations are holding steady, principally because of a good run of contracts for less than 100 tons each. Recent awards and fresh inquiry are shown on page 1284.

**Coke.**—Shipments of this commodity in April were a trifle heavier than in March, confirming the finding of pig iron producers that the melt of foundry iron in this district is slowly expanding. All ovens are lighted. The price is steady at $9.50, delivered in the Chicago switching district.

**Bolts, Nuts and Rivets.**—Specifications are being issued at a steady rate. Shipments in April were about equal to those in March, and bolt, nut and rivet manufacturers have held operations at a uniform rate. Prices for small rivets are steady at 70 and 10 to 70 per cent off list.

**Old Material.**—Prices in the Chicago scrap market are holding at the recent advances. Shipments of heavy melting steel are steady and consumption seems to be well balanced with production. The Gary mills are consistent buyers in small tonnages. The bulk of this grade that is moving to that point is in long pieces and prepared only so that it is ready for shearing at the mill. Dealers are getting $12.50 to $12.75 per gross ton, delivered, for heavy melting steel of that kind. The freight rate from Chicago to Gary is $1. Mill inspections are rigid and fully 50 per cent of the heavy melting steel that is gathered from miscellaneous yards is being rejected. There is a fair demand for specialties.

*Prices delivered consumers' yards, Chicago:*

| | *Per Gross Ton* | |
|---|---|---|
| Basic Open-Hearth Grades: | | |
| Heavy melting steel | $13.00 to | $13.50 |
| Shoveling steel | 13.00 to | 13.50 |
| Frogs, switches and guards, cut apart, and miscellaneous rails | 13.50 to | 14.00 |
| Hydraulic compressed sheets | 11.50 to | 12.00 |
| Drop forge flashings | 9.50 to | 10.00 |
| Forged, cast and rolled steel car-wheels | 15.50 to | 16.00 |
| Railroad tires, charging box size | 16.75 to | 17.25 |
| Railroad leaf springs, cut apart | 16.75 to | 17.25 |
| Acid Open-Hearth Grades: | | |
| Steel couplers and knckles | 14.50 to | 15.00 |
| Coil springs | 17.00 to | 17.50 |
| Electric Furnace Grades: | | |
| Axle turnings | 13.00 to | 13.50 |
| Low phosphorus punchings | 14.00 to | 14.50 |
| Low phosphorus plate, 12 in. and under | 14.25 to | 14.75 |
| Blast Furnace Grades: | | |
| Axle turnings | 10.00 to | 10.50 |
| Cast iron borings | 9.25 to | 9.75 |
| Short shoveling turnings | 9.25 to | 9.75 |
| Machine shop turnings | 7.00 to | 7.50 |
| Rolling Mill Grades: | | |
| Iron rails | 14.00 to | 14.50 |
| Rerolling rails | 14.00 to | 14.50 |
| Cupola Grades: | | |
| Steel rails less than 3 ft | 15.00 to | 15.50 |
| Angle bars, steel | 14.25 to | 14.75 |
| Cast iron carwheels | 13.50 to | 14.00 |
| Malleable Grades: | | |
| Railroad | 13.00 to | 13.50 |
| Agricultural | 12.00 to | 12.50 |
| Miscellaneous: | | |
| *Relaying rails, 56 to 60 lb | 23.00 to | 25.00 |
| *Relaying rails, 65 lb. and heavier | 26.00 to | 31.00 |
| | *Per Net Ton* | |
| Rolling Mill Grades: | | |
| Iron angles and splice bars | 14.00 to | 14.50 |
| Iron arch bars and transoms | 19.00 to | 19.50 |
| Iron car axles | 21.50 to | 22.00 |
| Steel car axles | 16.00 to | 16.50 |
| No. 1 railroad wrought | 11.50 to | 12.00 |
| No. 2 railroad wrought | 11.25 to | 11.75 |
| No. 1 busheling | 10.00 to | 10.50 |
| No. 2 busheling | 5.75 to | 6.25 |
| Locomotive tires, smooth | 12.50 to | 13.00 |
| Pipes and flues | 8.00 to | 8.50 |
| Cupola Grades: | | |
| No. 1 machinery cast | 14.00 to | 14.50 |
| No. 1 railroad cast | 12.75 to | 13.25 |
| No. 1 agricultural cast | 12.50 to | 13.00 |
| Stove plate | 11.25 to | 11.75 |
| Grate bars | 11.25 to | 11.75 |
| Brake shoes | 11.00 to | 11.50 |

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

# Philadelphia

## Bids of 1.85c. and 1.90c., Mill, on Plates, Shapes and Bars for Railroad

PHILADELPHIA, May 1.—Although eastern Pennsylvania mills shipped more steel in April than in any of the preceding months this year, the amount of new business booked in the past month was exceedingly small. Most of the current orders for plates, shapes and bars are almost of warehouse proportions. On such small lots the usual quotations are 2.05c., Coatesville, for plates; 2.05c., Bethlehem, for shapes, and 1.90c., Pittsburgh, for bars, but on more desirable orders $1 a ton lower is freely quoted. Quotations on shapes are quite generally on the basis of 2c., Bethlehem, even on small lots.

Opening of bids April 26 by the Pennsylvania Railroad for its second quarter requirements, consisting of 15,000 tons of plates, shapes and bars and smaller tonnages of blue annealed sheets and other products, brought out prices of 1.85c. to 1.90c., f.o.b. mill, on plates, shapes and bars. On blue annealed sheet 2.10c., Eastern mill, was quoted.

**Pig Iron.**—Foundries are taking full shipments against contracts, but there is almost no new business. Furnaces are maintaining $20, base. It is conceded, however, that should a fair-sized tonnage be offered, it might bring out a slight recession in price. Only occasional sales of low phosphorus are reported.

*Prices per gross ton at Philadelphia:*

| | |
|---|---|
| East. Pa. No. 2 plain, 1.75 to 2.25 sil. | $20.76 |
| East. Pa. No. 2X, 2.25 to 2.75 sil. | 21.26 |
| East. Pa. No. 1X | 21.76 |
| Basic (delivered eastern Pa.) | $19.50 to 20.00 |
| Gray forge | 19.75 to 20.25 |
| Malleable | 21.00 to 21.50 |
| Standard low phos. (f.o.b. New York State furnace) | 22.00 to 23.00 |
| Copper bearing low phos. (f.o.b. furnace) | 23.50 to 24.00 |
| Virginia No. 2 plain, 1.75 to 2.25 sil. | 24.54 to 25.04 |
| Virginia No. 2X, 2.25 to 2.75 sil. | 25.04 to 25.54 |

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

**Billets.**—The market is quiet and prices unchanged at $33, Pittsburgh, for rerolling billets and $38 per ton, Pittsburgh, for forging quality.

**Bars.**—A fair tonnage is moving on contracts, but new buying is decidedly limited. For new business, quotations range from 1.85c. to 1.90c. per lb., Pittsburgh, or 2.17c. to 2.22c., delivered Philadelphia, the higher price applying only on small lots for prompt shipment. On the Pennsylvania Railroad list of second quarter requirements totaling several thousand tons, 1.85c., f.o.b. mill, was quoted by the Bethlehem Steel Co., Donner Steel Co., Republic Iron & Steel Co. and Youngstown Sheet & Tube Co. Pittsburgh district mills quoted 1.90c., base mill, and Chicago mills, 2c., base mill.

**Warehouse Prices, f.o.b. Philadelphia**

| | Base per Lb. |
|---|---|
| Plates, ¼-in. and heavier | 2.50c. to 2.60c. |
| Plates, ⅛-in. | 2.80c. to 3.00c. |
| Structural shapes | 2.40c. to 2.60c. |
| Soft steel bars, small shapes and iron bars (except bands) | 2.50c. |
| Round-edge iron | 3.50c. |
| Round-edge steel, iron finished 1½ x 1½ in. | 3.50c. |
| Round-edge steel, planished | 4.30c. |
| Reinforcing steel bars, square, twisted and deformed | 2.50c. to 3.00c. |
| Cold-finished steel, rounds and hexagons | 3.35c. |
| Cold-finished steel, squares and flats | 3.85c. |
| Steel hoops | 3.60c. |
| Steel bands, No. 12 gage to ⅛-in., inclusive | 3.35c. |
| Spring steel | 5.00c. |
| *Black sheets (No. 24) | 4.00c. |
| †Galvanized sheets (No. 24) | 4.75c. |
| Blue annealed sheets (No. 10) | 3.15c. |
| Diamond pattern floor plates— ¼-in. | 5.30c. |
| ⅛-in. | 5.50c. |
| Rails | 3.20c. |
| Swedish iron bars | 6.60c. |

*For 50 bundles or more; 10 to 49 bundles, 4.25c. base; 1 to 9 bundles, 4.50c. base.
†For 50 bundles or more; 10 to 49 bundles, 5.10c. base; 1 to 9 bundles, 5.45c. base.

**Plates.**—New business is limited to small lots of plates not much larger than usually go to warehouses. Quotations range from 2c. to 2.05c. per lb., Coatesville, or 2.10c. to 2.15c., delivered Philadelphia. On the Pennsylvania Railroad opening of bids on second quarter requirements for Altoona, which included about 10,000 tons of plates, quotations were 1.85c. per lb., f.o.b. mill, by eastern Pennsylvania producers; 1.90c.. mill, by Pittsburgh district mills and 2c., mill, by Chicago producers. The Baldwin Locomotive Works has booked 10 more locomotives for the Southern Pacific Co., bringing the total of purchases by this railroad to 13 locomotives.

**Shapes.**—Quotations seem to have settled to 2c., Bethlehem, or 2.13c., delivered Philadelphia, which is the price at which deliveries are being made on second quarter contracts. On the Pennsylvania Railroad opening of bids for second quarter requirements, two eastern Pennsylvania mills quoted 2.005c. per lb., delivered Altoona, and a third 1.80c., f.o.b. mill. Pittsburgh mills bid 1.90c. per lb., mill, and Chicago producers 2c., mill. Not many projected buildings are reported for this district.

**Sheets.**—Prices are decidedly unsteady. Consumers of blue annealed sheets are pressing for downward revision of prices on their 2.10c. contracts. Current quotations are 2.05c., Pittsburgh, on general business, and in the case of automobile body builders, 2c., Pittsburgh. On the Pennsylvania Railroad second quarter requirements, eastern Pennsylvania mills quoted 2.10c., f.o.b. mill. Black sheets are quiet, with quotations of 2.75c. per lb., Pittsburgh, and galvanized sheets range from 3.60c. to 3.70c., Pittsburgh, the bulk of current business being done at the lower level.

**Warehouse Business.**—Prices continue firm, although business is only fair. Quantity differentials on steel bars and bar sized shapes and the recently adopted quantity bases for black and galvanized sheets are being extended to the entire Philadelphia district, instead of being confined to sales in Philadelphia and Camden.

**Imports.**—In the week ended April 28 ore arrivals totaled 235 tons, of which 200 tons was chrome ore from Turkey and 35 tons was manganese ore from Germany. Pig iron arrivals consisted of 749 tons from India and 51 tons from Italy. Steel imports were as follows: France, 502 tons of blooms; Germany, 58 tons of structural shapes; Belgium, 136 tons of structural shapes, 85 tons of bands and 10 tons of iron bars.

**Old Material.**—Prices of all grades are substantially unchanged, but only a small total of business is being transacted with eastern Pennsylvania consumers. One mill in this district, which recently tried to buy machine shop turnings at $10 per ton, delivered, later purchased some small tonnages at $10.50 and $10.75 per ton, and brokers are now asking $11 per ton, delivered, for a substantial tonnage. A consumer of specification pipe at Columbia, Pa., recently bought at $12 per ton, delivered, and about a week ago closed on a small lot of pipe at $12.50 per ton, delivered. No. 1 heavy melting steel is quiet and prices are unchanged.

*Prices per gross ton delivered consumers' yards, Philadelphia district:*

| | |
|---|---|
| No. 1 heavy melting steel | $13.50 to $14.00 |
| Scrap T rails | 13.00 to 13.50 |
| No. 2 heavy melting steel | 11.00 to 11.50 |
| No. 1 railroad wrought | 14.50 to 15.00 |
| Bundled sheets (for steel works) | 10.50 |
| Machine shop turnings (for steel works) | 10.50 to 10.75 |
| Heavy axle turnings (or equivalent) | 12.00 to 12.50 |
| Cast borings (for steel works and rolling mill) | 10.50 to 11.00 |
| Heavy breakable cast (for steel works) | 15.50 to 16.00 |
| Railroad grate bars | 12.00 to 12.50 |
| Stove plate (for steel works) | 12.00 |
| No. 1 low phos., heavy, 0.04 per cent and under | 17.50 to 18.00 |
| Couplers and knuckles | 15.50 to 16.00 |
| Rolled steel wheels | 15.50 to 16.00 |
| No. 1 blast furnace scrap | 10.50 to 11.00 |
| Machine shop turnings (for rolling mill) | 11.00 to 11.25 |
| Wrought iron and soft steel pipes and tubes (new specifications) | 12.00 to 12.50 |
| Shafting | 17.50 to 18.00 |
| Steel axles | 19.00 to 20.00 |
| No. 1 forge fire | 11.00 to 11.50 |
| Steel rails for rolling | 14.75 to 15.25 |
| Cast iron carwheels | 15.50 to 16.00 |
| No. 1 cast | 16.00 to 16.50 |
| Cast borings (for chemical plant) | 14.50 to 15.00 |

# New York

## Weakness in Plates, Sheets and Strips—Pig Iron Sales 7500 Tons

NEW YORK, May 1.—With competition keen and with no improvement in prices in sight, pig iron producers are giving increased attention to the use of waterways. Pig iron shipments by barge canal from Buffalo totaled 25,000 to 30,000 tons in 1927, and it is expected that this amount can be doubled this year. During the spring, when there is a heavy movement of grain through the State canal, barge rates are usually rather firm, but producers expect to obtain more attractive rates during the summer lull in canal traffic. One important Buffalo interest is reported to be negotiating for storage space for barge iron at Jersey City, N. J. At present, public docks with fixed handling charges are used for transferring iron from barge to car for shipment to inland points in New Jersey. Melters are showing little interest in pig iron for third quarter delivery, but inquiries for that period are expected late this month and in June. Current sales are made up largely of relatively small tonnages for fill-in purposes. Total bookings of local sellers, at about 7500 tons, fell 2000 tons short of sales for the previous week. The Crane Co., Bridgeport, Conn., is inquiring for 1000 tons of foundry, the Worthington Pump & Machinery Corporation wants 275 tons for Harrison, N. J., and the Moore Brothers Co., Elizabeth, N. J., is in the market for 100 tons of No. 3 foundry. The E. & G. Brooke Iron Co. expects to blow out its furnace at Birdsboro, Pa., this week for relining. The Standish, N. Y., stack of the Chateaugay Ore & Iron Co. will also probably go out in the current week.

*Prices per gross ton, delivered New York district:*

| | |
|---|---|
| Buffalo No. 2 fdy., sil. 1.75 to 2.25 | $20.91 to $21.91 |
| East. Pa. No. 2 fdy., sil. 1.75 to 2.25 | 20.39 to 22.52 |
| East. Pa. No. 2X fdy., sil. 2.25 to 2.75 | 20.89 to 23.02 |
| East. Pa. No. 1X fdy., sil. 2.75 to 3.25 | 21.39 to 23.52 |

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

**Reinforcing Bars.**—The Truscon Steel Co. will furnish 500 tons of bars for a section of the subway in Queens and 480 tons for a loft building in Manhattan. A bridge over the Raritan River at New Brunswick, N. J., requiring 2400 tons, is expected to be closed this week; foreign steel has been a strong competitor, but the job will probably go to a distributer of domestic bars. Except for these fairly large projects, the market is not active and the first four months of the year have not been equal in business to the like period in 1927 for most companies. Prices are unchanged, with a strengthening tendency on small projects.

**Finished Steel.**—Steel sales, including specifications against contracts, by local offices during April ran considerably ahead of the March tonnage, but the amount of new business was small, and some mills are now in the position of seeking tonnage for prompt delivery to round out rolling schedules. This has tended toward further weakness in prices, notwithstanding the generally high average of mill operations. Weakness has become more general in sheets, and has also extended to new business in plates and hot-rolled and cold-rolled strip steel. Wire nails are not strong, but there has been very little business to test prices. The plate price has weakened to the extent of at least $1 a ton on orders of a carload or more, sales having been made at 2.12½c. per lb., delivered New York district, or 1.95c., Coatesville, the freight rate from Coatesville being 17½c. per 100 lb. For Pittsburgh mills, this price is equivalent to 1.80½c. at that point. An Eastern mill has quoted a railroad 1.85c., delivered Cleveland, on plates. Hot-rolled strip steel in widths of 6 in. or more is quite generally obtainable at 1.85c., Pittsburgh or Cleveland, while cold-rolled strip steel is now on a base price of 3c., Pittsburgh or Cleveland, for lots under 3 tons, making the larger lot price 2.75c. Sheet prices have settled to 2.75c. or 2.80c. for black, with an occasional report of 2.70c.; the range on galvanized is 3.60c. to 3.65c. and on blue annealed 2c. to 2.10c., Pittsburgh base. Structural steel lettings include two jobs of fair size—5500 tons for a Pennsylvania Railroad bridge over Newark Bay, taken by the Bethlehem Steel Co., and 4800 tons for additional work in connection with the Hudson River bridge, awarded to the McClintic-Marshal Co. In railroad equipment, the inquiries of the Erie for 1000 freight cars and 35 passenger cars comprise the only prospective business of size.

*Mill prices per lb., delivered New York:* Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

**Cast Iron Pipe.**—Although there is only a moderate volume of activity in pressure pipe, there is a generally firmer tone to prices, and Birmingham foundries have advanced their quotations to $31 to $32 per ton, base, Birmingham, which apparently eliminates them from competition in the North, as nearby makers are quoting on a basis of $37.60 to $38.60 per net ton, delivered New York. The Department of Purchase, New York, will open bids May 10 on a total of 2754 tons of pipe and fittings, of which 1025 tons is 12-in., 1490 tons,

### Warehouse Prices, f.o.b. New York

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.30c. |
| Soft steel bars and small shapes | 3.25c. |
| Iron bars | 3.24c. |
| Iron bars, Swedish charcoal | 7.00c. to 7.25c. |
| Cold-finished shafting and screw stock— | |
| Rounds and hexagons | 3.40c. |
| Flats and squares | 3.90c. |
| Cold-rolled strip, soft and quarter hard, | 5.15c. to 5.40c. |
| Hoops | 4.50c. |
| Bands | 4.00c. |
| Blue annealed sheets (No. 10 gage) | 3.90c. |
| Long terne sheets (No. 24) | 5.80c. |
| Standard tool steel | 12.00c. |
| Wire, black annealed | 4.50c. |
| Wire, galvanized annealed | 5.15c. |
| Tire steel, 1½ x ½ in. and larger | 3.30c. |
| Smooth finish, 1 to 2½ x ¼ in. and larger | 3.65c. |
| Open-hearth spring steel, bases | 4.50c. to 7.00c. |

| Machine bolts, cut thread: | Per Cent Off List |
|---|---|
| ¾ x 6 in. and smaller | 55 to 60 |
| 1 x 30 in. and smaller | 50 to 50 and 10 |
| Carriage bolts, cut thread: | |
| ½ x 6 in. and smaller | 55 to 60 |
| ¾ x 20 in. and smaller | 50 to 50 and 10 |
| Coach screws: | |
| ½ x 6 in. and smaller | 55 to 60 |
| 1 x 16 in. and smaller | 50 to 50 and 10 |

| Boiler Tubes— | Per 100 Ft. |
|---|---|
| Lap welded steel, 2-in. | $17.33 |
| Seamless steel, 2-in. | 20.24 |
| Charcoal iron, 2-in. | 25.00 |
| Charcoal iron, 4-in. | 67.00 |

*Discounts on Welded Pipe*

| *Standard Steel*— | Black | Galv. |
|---|---|---|
| ⅛-in. butt | 46 | 29 |
| ¾-in. butt | 51 | 37 |
| 1-3-in. butt | 53 | 39 |
| 2½-6-in. lap | 48 | 35 |
| 7 and 8-in. lap | 44 | 17 |
| 11 and 12-in. lap | 37 | 12 |
| *Wrought Iron*— | | |
| ⅛-in. butt | 5 | +19 |
| ¾-in. butt | 11 | + 9 |
| 1-1½-in. butt | 14 | + 6 |
| 2-in. lap | 5 | +14 |
| 3-6-in. lap | 11 | + 6 |
| 7-12-in. lap | 3 | +16 |

*Tin Plate* (14 *x* 20 *in.*)

| | Prime | Seconds |
|---|---|---|
| Coke, 100 lb. base box | $6.45 | $6.20 |
| Charcoal, per box— | A | AAA |
| IC | $9.70 | $12.10 |
| IX | 12.00 | 14.25 |
| IXX | 13.90 | 16.00 |

*Terne Plate* (14 *x* 20 *in.*)

| | |
|---|---|
| IC—20-lb. coating | $10.00 to $11.00 |
| IC—30-lb. coating | 12.00 to 13.00 |
| IC—40-lb. coating | 13.75 to 14.25 |

*Sheets Box Annealed—Black, C. R. One Pass*

| | Per Lb. |
|---|---|
| Nos. 18 to 20 | 3.80c. |
| No. 22 | 3.95c. |
| No. 24 | 4.00c. |
| No. 26 | 4.10c. |
| No. 28* | 4.25c. |
| No. 30 | 4.50c. |

*Sheets, Galvanized*

| | Per Lb. |
|---|---|
| No. 14 | 4.35c. |
| No. 16 | 4.20c. |
| No. 18 | 4.35c. |
| No. 20 | 4.50c. |
| No. 22 | 4.55c. |
| No. 24 | 4.70c. |
| No. 26 | 4.95c. |
| No. 28* | 5.20c. |
| No. 30 | 5.60c. |

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

8-in. and 130 tons, 6-in. pipe and 109 tons is fittings. Contractors' bids were opened today by the Department of Water Supply, Gas and Electricity, New York, on 810 tons of 6, 12 and 20-in. pipe. The General Fire Extinguisher Co., Providence, R. I., is inquiring for about 4000 tons of small-sized pipe. East Bridgewater, Mass., has opened bids on about 100 tons of 6-in. water pipe.

*Prices per net ton, delivered New York:* Water pipe 6-in. and larger, $37.60 to $38.60; 4-in. and 5-in., $42.60 to $43.60; 3-in., $52.60 to $53.60; Class A and gas pipe, $4 to $5 extra.

**Warehouse Business.**—The past month compared favorably with March in the volume of business taken by most warehouses in this district. On plates, shapes and bars, however, mills are reported to be appearing as competitors for small tonnages, on which they offer fairly prompt deliveries. The quantity differentials recently adopted are being maintained, except for the 50c. charge on each order of 249 lb. or less, which has been dropped. Higher quotations on black and galvanized sheets, which have prevailed for several weeks in the local New Jersey market have been eliminated and jobbers are quoting the lower price of 4c. per lb., base, for black sheets and 4.70c. per lb., base, for galvanized sheets. Occasionally concessions are reported from this level, and galvanized sheets have been offered at several dollars a ton less.

**Coke.**—Buying is still limited. Prices are unchanged. Standard furnace grade is quoted at about $2.75 per ton, Connellsville. Delivered prices on special brands of foundry coke are: To northern New Jersey, Jersey City and Newark, $8.71 to $8.81 per net ton; to New York and Brooklyn, $9.59 to $9.69 per net ton. By-product coke ranges from $9 to $9.40 per net ton, Newark or Jersey City, N. J., and from $10.06 to $10.29 per ton, New York or Brooklyn.

**Old Material.**—Except for a few grades of scrap, which are slightly lower on dealers' offers, the market is unchanged. Brokers with contracts in eastern Pennsylvania are unwilling to pay more than $15.50 per ton for steel car axles. A Bound Brook, N. J., consumer of chemical borings has purchased at $13.25 per ton, delivered on a $2 per ton freight rate from New York. Machine shop turnings are quoted at $10 to $10.25 per ton, delivered eastern Pennsylvania. Specification pipe prices range from $11.50 to $12 per ton, delivered to users at Lebanon and Columbia, Pa. No. 1 heavy melting steel continues inactive, with purchases by brokers at $13.50 per ton, delivered, eastern Pennsylvania.

*Dealers' buying prices per gross ton f.o.b. New York:*

| | |
|---|---|
| No. 1 heavy melting steel | $10.00 to $10.85 |
| Heavy melting steel (yard) | 6.75 to 7.25 |
| No. 1 heavy breakable cast | 11.25 to 12.00 |
| Stove plate (steel works) | 7.75 to 8.00 |
| Locomotive grate bars | 8.00 to 8.50 |
| Machine shop turnings | 6.50 to 7.25 |
| Short shoveling turnings | 6.50 to 7.25 |
| Cast borings (blast furnace or steel works) | 6.25 to 7.25 |
| Mixed borings and turnings | 6.50 to 7.25 |
| Steel car axles | 15.00 to 15.50 |
| Iron car axles | 23.75 to 24.75 |
| Iron and steel pipe (1 in. dia., not under 2 ft. long) | 7.75 to 8.25 |
| Forge fire | 6.75 to 7.00 |
| No. 1 railroad wrought | 10.00 to 10.50 |
| No. 1 yard wrought, long | 8.50 to 9.00 |
| Rails for rolling | 10.00 to 10.50 |
| Cast iron carwheels | 10.75 to 11.25 |
| Stove plate (foundry) | 8.50 to 8.75 |
| Malleable cast (railroad) | 10.00 |
| Cast borings (chemical) | 10.75 to 11.25 |

*Prices per gross ton, delivered local foundries:*

| | |
|---|---|
| No. 1 machinery cast | $13.75 to $14.25 |
| No. 1 heavy cast (columns, building materials, etc.), cupola size | 11.75 to 12.25 |
| No. 2 cast (radiators, cast boilers, etc.) | 11.25 to 11.75 |

**Warehouse Prices, f.o.b. Cleveland**

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.00c. |
| Soft steel bars | 3.00c. |
| Reinforcing steel bars | 2.25c. to 2.75c. |
| Cold-finished rounds and hexagons | 3.65c. |
| Cold-finished flats and squares | 4.15c. |
| Hoops and bands | 3.65c. |
| Cold-finished strip | *5.95c. |
| Black sheets (No. 24) | 3.75c. |
| Galvanized sheets (No. 24) | 4.40c. to 4.60c. |
| Blue annealed sheets (No. 10) | 3.25c. |
| No. 9 annealed wire, per 100 lb | $2.90 |
| No. 9 galvanized wire, per 100 lb | 3.35 |
| Common wire nails, base per keg | 2.90 |

*Net base, including boxing and cutting to length.

# Cleveland

## May Steel Specifications for Automobile Industry Heavy—Sheets Weaker

CLEVELAND, May 1.—Specifications for steel bars, plates and structural material were light the past week, April ending differently in that respect from March, which closed with a rush of orders against expiring first quarter contracts. Not much new business is being placed, most buyers being under contract. April business declined fully 25 per cent compared with the previous month. This, however, is not indicative of any falling off in consumption, but it is because buyers are now using up steel ordered in March, which is apparently being consumed at the recent rate. With heavy shipments against old orders, many consumers are not specifying full monthly quotas against second quarter contracts. Some of the mills report that these specifications in April were only 75 per cent of the buyers' quotas. In spite of the falling off, April specifications ran ahead of the same month last year.

Specifications from the automotive industry for steel sheets and strip steel for May shipment are heavy, and it is expected that the seasonal slowing down of this industry will not materialize until a month later than last year, although two leading car builders are reducing production, one for a change of models. Little new inquiry is coming from the building field for fabricated steel. The Nickel Plate Railroad has exercised its option to take 6000 tons of rails in addition to its recent definite purchase for its 1928 requirements. The additional tonnage will be divided among the four mills that took the original orders.

On steel bars, plates and structural material, the market is firm at 1.85c., only less than car lots going at 1.90c. Cleveland mills quote steel bars at 1.85c., mill.

**Pig Iron.**—Third quarter buying has started in a limited way at the prevailing second quarter Lake furnace prices. One producer made a few sales for the quarter during the week and others appear willing to sell for that delivery at current prices, although none has started to solicit orders. Sales by Cleveland interests the past week aggregated 21,000 tons, or about the same as during the previous week. An Erie, Pa., foundry purchased 1000 tons, mostly for the third quarter. Some sellers report an increase in sales for early shipment. Prices on foundry and malleable grades show no change. Local furnaces quote $16.75 to $17 for outside shipment, but still seem willing to go to $16.50 in highly competitive territories. In Michigan the market is steady at $18. On the recent inquiry for a round lot of basic iron for shipment to Alliance, Ohio, a Valley producer quoted $16.50, and that is now regarded as the top of the market for basic. A northern Ohio foundry has purchased 500 tons of low phosphorus iron from a Valley producer at $26.50 and higher quotations on that grade have disappeared. English low phosphorus iron is being offered at $26, delivered Chicago, and other Lake ports to be shipped as ballast in boats for the new Welland canal that are being built in England for the Great Lakes trade. Pig iron shipments by Cleveland interests held up in good volume during April, being about the same as in March, and some of the automobile foundries have issued specifications for as much iron in May as during April. However, shipments to some industries outside of the automotive field are slow, some of the foundries not yet having taken all their first quarter iron.

*Prices per gross ton at Cleveland:*

| | |
|---|---|
| N'th'n No. 2 fdy., sil. 1.75 to 2.25 | $18.50 |
| Southern fdy., sil. 1.75 to 2.25 | 22.00 |
| Malleable | 18.50 |
| Ohio silvery, 8 per cent | 28.00 |
| Basic, Valley furnace | 16.50 |
| Standard low phos., Valley furnace | 26.50 |

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

**Sheets.**—Mills supplying the automotive industry continue to get good specifications from that source, but the demand from other consumers is light, and the eagerness of some mills to take orders has led to fur-

ther weakening in prices of about $2 a ton, except on auto body sheets, which are holding firm at 4c., Pittsburgh. With keener competition, the Valley district has again become a rather common basing point. On black sheets, 2.75c., Pittsburgh, is commonly quoted, but this has been shaded to 2.75c., Valley, and there are reports of a 2.70c., Valley, price. On blue annealed sheets, 1.90c., Pittsburgh, and 2c., Valley mill, are being named. However, some mills are holding firmly to 2c., Pittsburgh. Galvanized sheets have weakened to 3.55c., Valley, ranging from that price to 3.65c., Pittsburgh.

**Strip Steel.**—Mills are still getting a good volume of orders for hot-rolled strip and some have fair backlogs. However, prices are weak. Fairly representative quotations are 1.80c., Pittsburgh, for material 6-in. to 12-in. wide, and 2.05c. on 3-in. to 6-in. strip. On wider material competition of blue annealed sheets is causing price irregularities. Cold-rolled strip is 2.75c., Cleveland, for 3 tons and over. The reduction on auto body sheets has affected fender stock, which is now quoted at 4.10c. to 4.15c., compared with the recent 4.20c. price.

**Wire Products.**—Mills continue to quote nails at $2.65 per keg, Cleveland, for this immediate territory, but not much business is being placed at that price. In central and southern Ohio, $2.55 is commonly quoted by more than one producer. Plain wire is firm at 2.50c. per lb., Cleveland.

**Warehouse Business.**—Steel bars, plates and structural material are moving in fair volume, and prices are firm. The demand for galvanized sheets is below the seasonal average. Prices are somewhat irregular, being shaded $1 to $2 a ton.

**Semi-Finished Steel.**—Specifications are keeping close to recent volume, but there is very little new business. Prices are steady at $33, Cleveland, for sheet bars, billets and slabs.

**Reinforcing Bars.**—New demand is dull for this season of the year. Work for which the Cleveland Union Terminals Co. has an inquiry out will require 2500 tons. This was reported last week as an unstated tonnage. Rail steel bars are unchanged at 1.75c., mill.

**Old Material.**—Activity is still confined to small-lot purchases by dealers against old orders. Mills continue to restrict shipments. Prices show neither an upward nor downward tendency. Small lots of heavy melting steel are moving at the quoted prices. While some blast furnace scrap has been sold at $9.25, most of the business is going at $9.50. Considerable scrap is being shipped from Detroit to Cleveland by boat, and it is understood that much of the scrap recently offered by the Michigan automobile companies for May shipment will go to Pittsburgh district mills.

*Prices per gross ton, delivered consumers' yards:*

| | |
|---|---|
| **Basic Open-Hearth Grades** | |
| No. 1 heavy melting steel | $13.50 to $13.75 |
| No. 2 heavy melting steel | 12.75 to 13.00 |
| Compressed sheet steel | 12.50 to 12.75 |
| Light bundled sheet stampings | 11.50 to 11.75 |
| Drop forge flashings | 12.00 to 12.50 |
| Machine shop turnings | 7.00 to 7.50 |
| No. 1 railroad wrought | 11.50 to 12.00 |
| No. 2 railroad wrought | 13.50 to 14.00 |
| No. 1 busheling | 11.00 to 11.25 |
| Pipes and flues | 9.00 to 9.50 |
| Steel axle turnings | 12.50 to 13.00 |
| **Acid Open-Hearth Grades** | |
| Low phosphorus forging crops | 16.50 to 17.00 |
| Low phosphorus, billet, bloom and slab crops | 17.00 to 17.50 |
| Low phosphorus sheet bar crops | 16.50 to 17.00 |
| Low phosphorus plate scrap | 16.00 to 16.50 |
| **Blast Furnace Grades** | |
| Cast iron borings | 9.25 to 9.50 |
| Mixed borings and short turnings | 9.25 to 9.50 |
| No. 2 busheling | 9.25 to 9.50 |
| **Cupola Grades** | |
| No. 1 cast | 16.50 to 17.00 |
| Railroad grate bars | 11.00 to 12.00 |
| Stove plate | 12.00 to 12.50 |
| Rails under 3 ft. | 18.00 to 18.50 |
| **Miscellaneous** | |
| Railroad malleable | 15.00 to 15.50 |
| Rails for rolling | 16.25 to 16.50 |

**Iron Ore.**—A steel interest in the Buffalo territory has arranged for 1928 requirements by the purchase of a round block of ore at the regular market price and by a trade deal on the terms of which it will exchange ore from its own mines for other grades. Something over 200,000 tons was involved in the transaction, the greater part being covered by the exchange arrangement. The market does not show much activity, although a few small-lot sales are reported. Some of the open market buyers are covering only for three or four months' requirements and expect to come in the market again during the latter part of the season. Ore shipments will probably start late this week.

**Bolts, Nuts and Rivets.**—Specifications for bolts and nuts are fair, but the volume of April business fell slightly below that of March. Rivet specifications last month also fell below those of March, this being accounted for by large orders placed late in March against first quarter contracts carrying a lower price than now prevailing.

**Coke.**—Foundry grades are in fair demand. The April prices of $7.75, Painesville, and $6, Connellsville, for Ashland coke for by-product foundry grades have been re-established for May. Connellsville foundry coke is unchanged at $3.75 to $5.10, ovens.

## LESS AUSTRIAN MAGNESITE

### Exports in 1927 Were 21 Per Cent Below 1913 —Half Goes to United States

EXPORTS of burned magnesite from Austria decreased to 97,000 metric tons in 1927, against 123,000 tons in 1913, according to a report received by the Department of Commerce, Washington, from John Hurley, consul at Vienna. The drop in exports of this important trade item of Austria, which contributes more than $4,000,000 toward that country's large trade deficit, is attributed to developments that took place during the war. Some of the nations to which this supply was no longer accessible introduced the use of substitutes, and a few succeeded in discovering workable deposits within their own territory. Although sales to the United States declined during the past year, it is still the most important market for Austrian magnesite.

Working at full capacity, the report says, the Austrian industry is able to furnish 70 per cent of an estimated world requirement of 300,000 tons of burned magnesite, Austria having been given 74 per cent of the deposits belonging to the dual monarchy and Czechoslovakia the remainder. More than 90 per cent of the burned magnesite and magnesite manufactures produced in Austria during recent years has been exported, and the industry is much less dependent on economic conditions at home than in its most important foreign markets.

The increase of the American import duty on magnesite in 1922 affected sales, and the English coal strike in 1926, which caused reduced iron and steel operations, had an unfavorable effect on exports to Great Britain. On the other hand, the German industrial boom in 1927 is declared to have been responsible to a considerable extent for the increased output of magnesite in Austria that year. In 1927 the production of raw magnesite amounted to 356,000 tons, as compared with 237,000 in 1926 and 290,000 tons in 1925. The output of dead burned magnesite in 1927 totaled 125,000 tons. Of the 59,886 tons of dead burned magnesite exported during the first nine months of 1927, the United States took 28,517 tons; Germany, 11,542; and Great Britain, 7786 tons.

It is the policy to quote higher prices in the domestic market and for exports to Germany and Spain, which are more or less dependent on the Austrian and Czechoslovakian product, than on business with the United States and Great Britain, in consideration of the competition of American producers. Present prices of dead burned magnesite to the most important markets, at the plant in Styria, range from $14.38 a metric ton for the United States to $18.50 for the domestic market.

Use of the word "steel" as a brand or label for tools made entirely or partly of metals other than steel is prohibited in a recent stipulation agreement between the Federal Trade Commission and a seller of hardware. The company, according to the commission, agreed to discontinue use of the word "steel" in its advertising.

# San Francisco

## Award of 8000 Tons of Steel for Aqueducts Expected Soon

SAN FRANCISCO, April 28 (*By Air Mail*).—Interest is centered in the aqueducts for the East Bay Municipal Utility District at Oakland, calling for more than 8000 tons of plates, and an award is expected within the next week or 10 days. Demand generally has eased off somewhat and bookings this week were by no means heavy.

**Pig Iron.**—Movement of foundry iron continues light. Little or no improvement is noticed in the rate of foundry operations. A shipment of Indian iron, about 1400 tons, is due next week. Part of this will be unloaded at Los Angeles and the rest will be taken by bay district users. Prices are unchanged.

*Prices per gross ton at San Francisco:*

| | |
|---|---|
| *Utah basic | $25.00 to $26.00 |
| *Utah foundry, sil. 2.75 to 3.25 | 25.00 to 26.00 |
| **Indian foundry, sil. 2.75 to 3.25 | 24.00 to 25.00 |
| **German foundry, sil. 2.75 to 3.25 | 24.25 |

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

**Bars.**—Out-of-stock prices on reinforcing steel bars in the San Francisco district are exceptionally low, and lower than 2c. has recently been quoted. When it is considered that plates and shapes are holding firm at 2.30c. to 2.35c., c.i.f. respectively, the extent of the weakness in bar prices is clearly seen. Only one or two projects calling for more than 100 tons were reported placed this week, the bulk of the current business involving small lots. The largest new industry calls for 155 tons for piers for the West Waterway bridge in Seattle.

**Plates.**—Twohy Brothers & Shea, Inc., was low bidder on the Wildcat and Sequoia aqueducts combined on the basis of electrically welded steel pipe. The Lock Joint Pipe Co., Ampere, N. J., was low bidder on the Wildcat aqueduct for steel lined concrete pipe. Bids were taken also on class C cast iron pipe. The Steel Tank & Pipe Co., bidding through Twohy Brothers & Shea, Inc., was low on the fabrication of the steel pipe. The Pacific Car & Foundry Co., Seattle, was awarded 1500 tons of plates and shapes for 250 underframes for the Chicago, Milwaukee, St. Paul & Pacific Railroad. Exclusive of the Oakland aqueducts, pending business is confined to one or two projects. Tacoma has come into the market for 115 tons of 48-in. riveted pipe.

**Shapes.**—Although about 8000 tons of structural material is up for figures or pending, only four awards of importance have been made in the week. The Moore Dry Dock Co. took 100 tons for the mine of Clinton West Co. at Bodie, Cal. The Union Iron Works booked 160 tons for a hotel in Los Angeles and the Portland Bridge Co. took 220 tons for a bridge at Coburg, Ore. The California Steel Co. was low bidder on 380 tons for a warehouse for the Oakland Port Commission, at about $97 a ton erected.

**Cast Iron Pipe.**—Inquiries for cast iron pipe were limited to one or two projects. Livingston, Cal., has come into the market again for 364 tons of 2 to 10-in. class B or 150, having rescinded the contract recently awarded to Robert McNair of Oakland. Bids will be opened May 14. The United States Cast Iron Pipe & Foundry Co. booked 8744 tons of 4 to 30-in. centrifugal pipe for Long Beach, Cal. Oak Harbor, Wash., placed with unnamed interest 132 tons of 4 and 6-in. class B pipe. Bert Noble of San Diego took 210 tons of 6 and 8-in. class C for San Diego. An unnamed company took 127 tons of 6-in. class B for Riverside, Cal. Prices continue around $35 to $36 a ton, delivered, on 6-in. class B and larger.

**Standard Pipe.**—Movement of standard pipe and oil country goods, with few exceptions, is limited to unimportant orders. The Kelly Pipe & Machinery Co., Los Angeles, was awarded 155 tons of 4 to 6-in. steel casing for the Rialto, Cal. The Steel Plate Construction Co., Portland, took 100 tons of 1¼-in. galvanized pipe for a refrigerator cooling plant for the Terminal Ice & Cold Storage Co., Salem, Ore. No action has yet been taken on the 700 tons of 4 to 20-in. lapwelded pipe for Monrovia, Cal.

**Coke.**—This market reflects the quiet condition noted in the foundry pig iron market. Both sales and inquiries are confined to unimportant lots.

**Warehouse Prices, f.o.b. San Francisco**

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.15c. |
| Soft steel bars | 3.15c. |
| Small angles, ⅞-in. and over | 3.15c. |
| Small angles, under ⅞-in. | 3.55c. |
| Small channels and tees, ¾-in. to 2¾-in. | 3.75c. |
| Spring steel, ¼-in. and thicker | 5.00c. |
| Black sheets (No. 24) | 4.95c. |
| Blue annealed sheets (No. 10) | 3.90c. |
| Galvanized sheets (No. 24) | 5.50c. |
| Structural rivets, ½-in. and larger | 5.65c. |
| Common wire nails, base per keg | $3.40 |
| Cement coated nails, 100-lb. keg | 3.40 |

# Birmingham

## Pig Iron Sales in Small Lots—Finished Steel Firm

BIRMINGHAM, May 1.—Sales of pig iron are confined almost entirely to small lots, which is in line with conditions for the past several weeks. Previous bookings are largely responsible for the lack of activity at present. Two of the merchant producers in the district report shipments in good volume and close to make, while the third has found shipments light since the early part of April. Foundry iron sales are still on a $16 base. The number of active furnaces has not changed during the past three weeks, 17 being in blast. Of this number, 10 are on foundry, five on basic, one on recarburizing iron and one on ferromanganese.

*Prices per gross ton, f.o.b. Birmingham district furnaces:*

| | |
|---|---|
| No. 2 foundry, 1.75 to 2.25 sil. | $16.00 |
| No. 1 foundry, 2.25 to 2.75 sil. | 16.50 |
| Basic | 15.00 |

**Finished Steel.**—The market developed a slightly firmer tone during the past week. New business continues to come in at a steady rate, and the outlook for the next few weeks is considered by sales officials to be fair. New business with structural steel and reinforcing bar manufacturers is still light. The Southern Steel Works Co. has an order for 200 tons for the Crawford Auto Shop. Open-hearth operations have not changed during the past week. The Tennessee company has seven in operation at Ensley and four at Fairfield, while the Gulf States Steel Co. continues with four at Alabama City.

**Cast Iron Pipe.**—New business with the pressure pipe manufacturers is moderate, consisting chiefly of small orders. Several good sized projects are pending, and orders will probably be placed within the next two or three weeks. Prices are firmer, with the base still at $29 to $31.

**Coke.**—Spot sales of foundry coke are holding up to a fair average. Shipments are going forward in good volume. Quotations remain at $5.

**Old Material.**—Demand in some lines is considerably stronger, but prices are unchanged. More No. 1 machinery cast was sold last week than in some time. Steel scrap trading is fair. Sales in other lines continue low.

*Prices per gross ton, delivered Birmingham district consumers' yards:*

| | |
|---|---|
| Heavy melting steel | $9.50 to $10.00 |
| Scrap steel rails | 11.00 to 11.50 |
| Short shoveling turnings | 8.00 to 8.50 |
| Cast iron borings | 8.00 |
| Stove plate | 14.50 |
| Steel axles | 19.00 to 20.00 |
| Iron axles | 20.00 to 21.00 |
| No. 1 railroad wrought | 10.00 to 10.50 |
| Rails for rolling | 13.00 |
| No. 1 cast | 14.50 |
| Tramcar wheels | 12.50 to 13.50 |
| Cast iron carwheels | 12.00 to 13.00 |
| Cast iron borings, chemical | 13.50 to 14.00 |

# Canada

## Foundry and Malleable Pig Iron in Good Demand—Structural Steel Active

TORONTO, ONT., May 1.—A steady demand for foundry and malleable pig iron continues to feature business in the Canadian markets. Spot sales are mostly in small lots, but the total volume is satisfactory. Shipping orders against contracts are responsible for a good movement of iron from furnaces. Consumption of pig iron in this country shows considerable gain over that of a year ago, but production has not kept pace. This is chiefly because of increased competition from United States and British sources of production, which has affected the Canadian market, especially as most of this imported iron is selling at prices under Canadian quotations, despite the fact that the latter have been reduced in order to meet the competition. Canadian prices are unchanged.

*Prices per gross ton:*

| | |
|---|---|
| **Delivered Toronto** | |
| No. 1 foundry, sil. 2.25 to 2.75 | $23.10 to $23.60 |
| No. 2 foundry, sil. 1.75 to 2.25 | 23.10 to 23.60 |
| Malleable | 23.10 to 23.60 |
| **Delivered Montreal** | |
| No. 1 foundry, sil. 2.25 to 2.75 | 24.50 to 25.00 |
| No. 2 foundry, sil. 1.75 to 2.25 | 24.50 to 25.00 |
| Malleable | 24.50 to 25.00 |
| Basic | 24.00 |
| **Imported Iron at Montreal Warehouse** | |
| Summerlee | 33.50 |
| Carron | 33.00 |

**Finished Steel.**—Structural steel and reinforcing bar sales continue to show improvement, and at the present time are among the most active of the various lines of iron and steel materials. The Dominion Bridge Co. and the McGregor & McIntyre Structural Steel Co. shared a contract for 2800 tons of structural and 1000 tons of reinforcing bars for the Robert Simpson Co. addition in Toronto. Proposed bridge construction is having a stimulating effect in structural and reinforcing steel. Two or three International bridges are proposed which will involve the use of upward of 25,000 tons of steel. About 3000 tons of steel will be required for the Ville Lasalle, Que., bridge. A bridge at Carlton Place, Ont., will take 300 tons. Approximately 1000 tons of structural and 500 tons of reinforcing steel will be purchased for Hanson Brothers office building in Montreal.

**Old Material.**—Current sales are mostly small tonnages, but are fairly numerous. Consumers in Ontario and Quebec continue to adhere to the hand-to-mouth method of buying. Prices are unchanged but are not strong.

*Dealers' buying prices:*

| | Toronto | Montreal |
|---|---|---|
| *Per Gross Ton* | | |
| Heavy melting steel | $9.00 | $8.00 |
| Rails, scrap | 10.00 | 10.00 |
| No. 1 wrought | 9.00 | 11.00 |
| Machine shop turnings | 7.00 | 6.00 |
| Boiler plate | 7.00 | 7.00 |
| Heavy axle turnings | 7.50 | 7.50 |
| Cast borings | 7.50 | 6.00 |
| Steel turnings | 7.00 | 6.50 |
| Wrought pipe | 5.00 | 6.00 |
| Steel axles | 14.00 | 19.00 |
| Axles, wrought iron | 16.00 | 21.00 |
| No. 1 machinery cast | .... | 16.00 |
| Stove plate | .... | 12.00 |
| Standard carwheels | .... | 14.50 |
| Malleable | .... | 13.00 |
| *Per Net Ton* | | |
| No. 1 machinery cast | 15.00 | .... |
| Stove plate | 9.00 | .... |
| Standard carwheels | 13.00 | .... |
| Malleable scrap | 13.00 | .... |

**Warehouse Prices, f.o.b. Buffalo**

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.40c. |
| Soft steel bars | 3.30c. |
| Reinforcing bars | 2.75c. |
| Cold-finished flats, squares and hexagons | 4.45c. |
| Rounds | 3.95c. |
| Cold-rolled strip steel | 5.85c. |
| Black sheets (No. 24) | 4.30c. |
| Galvanized sheets (No. 24) | 5.15c. |
| Blue annealed sheets (No. 10) | 3.80c. |
| Common wire nails, base per keg | $3.65 |
| Black wire, base per 100 lb | 3.90 |

# Buffalo

## Pig Iron Market Is Quiet—Steel Operating Rate Continues High

BUFFALO, May 1.—The pig iron market has been quiet during the past week. Inquiry is light. The Eastern Malleable Iron Co. placed part of the 2500 tons for which it inquired with a Buffalo furnace. An Erie, Pa., consumer ordered 1000 tons of 2X, the major portion going to the Perry furnace. A downstate inquiry is for 500 tons of foundry, and several inquiries of from 100 to 300 tons of foundry and malleable have been converted into orders. Shipping directions are continuing in fair volume.

*Prices per gross ton, f.o.b. furnace:*

| | |
|---|---|
| No. 2 plain fdy., sil. 1.75 to 2.25 | $17.00 |
| No. 2 foundry, sil. 2.25 to 2.75 | 17.50 |
| No. 1X foundry, sil. 2.75 to 3.25 | 18.50 |
| Malleable, sil. up to 2.25 | 17.50 |
| Basic | $16.50 to 17.00 |
| Lake Superior charcoal | 27.28 |

**Finished Iron and Steel.**—Inquiry for bars and shapes is fair. Sheet mill operation remains at 85 to 90 per cent. Reinforcing bar projects placed during the week included one mill addition of 100 tons and a high school stadium of 200 tons. Bids are asked on 100 tons for a warehouse and 300 tons for a school. Business in welded fabric and fence wire is reported good. The Wickwire-Spencer plant is running at 75 per cent in the open-hearth department. The Donner Steel Co. is operating five of its nine open-hearth furnaces and Bethlehem's Lackawanna plant 21 of its 24. About 90 per cent operation is being maintained by the Buffalo Bolt Co. April has been the heaviest month of the year in warehouse sales.

**Old Material.**—A consumer is reported to have purchased No. 1 heavy melting steel, about 1000 tons, at $14.75. Machine shop turnings were sold at Niagara Falls, N. Y., at $9.50 to $9.75, and some stove plate is reported to have been sold at around $13.50. A small tonnage of No. 1 machinery cast was sold at slightly less than $15. Dealers are buying actively against old orders.

*Prices per gross ton, f.o.b. Buffalo consumers' plants:*

| | |
|---|---|
| **Basic Open-Hearth Grades** | |
| No. 1 heavy melting steel | $14.50 to $15.00 |
| No. 2 heavy melting steel | 12.75 to 13.25 |
| Scrap rails | 13.75 to 14.25 |
| Hydraulic compressed sheets | 13.00 to 13.50 |
| Hand bundled sheets | 9.00 to 9.50 |
| Drop forge flashings | 12.00 to 12.50 |
| No. 1 busheling | 13.25 to 13.75 |
| Heavy steel axle turnings | 12.50 to 12.75 |
| Machine shop turnings | 8.25 to 8.75 |
| **Acid Open-Hearth Grades** | |
| Railroad knuckles and couplers | 15.50 to 16.00 |
| Railroad coil and leaf springs | 15.50 to 16.00 |
| Rolled steel wheels | 15.50 to 16.00 |
| Low phosphorus billet and bloom ends | 17.00 to 17.50 |
| **Electric Furnace Grades** | |
| Heavy steel axle turnings | 12.75 to 13.25 |
| Short shoveling steel turnings | 10.75 to 11.25 |
| **Blast Furnace Grades** | |
| Short shoveling steel turnings | 10.50 to 11.00 |
| Short mixed borings and turnings | 9.50 to 10.00 |
| Cast iron borings | 9.75 to 10.25 |
| No. 2 busheling | 9.00 to 9.50 |
| **Rolling Mill Grades** | |
| Steel car axles | 17.00 to 17.50 |
| Iron axles | 22.00 to 23.00 |
| No. 1 railroad wrought | 12.50 to 13.00 |
| **Cupola Grades** | |
| No. 1 machinery cast | 14.50 to 15.00 |
| Stove plate | 13.50 to 13.75 |
| Locomotive grate bars | 12.00 to 12.50 |
| Steel rails, 3 ft. and under | 16.50 to 17.00 |
| Cast iron carwheels | 13.00 to 13.50 |
| **Malleable Grades** | |
| Railroad | 15.00 to 15.25 |
| Agricultural | 15.00 to 15.25 |
| Industrial | 15.00 to 15.25 |

Shipments of iron and steel products down the Ohio River in 1927 totaled 1,036,621 tons, compared with 575,462 tons in the previous year, an increase of almost 100 per cent. About one-fourth of the iron and steel tonnage traveled the full length of the river and then down the Mississippi River to Memphis and New Orleans. The average haul of all classes of commerce transported last year increased from 56 to 60 miles, with a total ton-mileage increase of 10 per cent.

# Youngstown

## Steel Shipments Exceed Incoming Business—Sheets Continue Weak

YOUNGSTOWN, May 1.—While steel ingot production in this district is holding up fairly well to its recent rate of about 80 per cent of capacity, signs point strongly to a recession soon, since shipments generally are exceeding incoming business. No slackening of sheet mill operations is observed, but scheduling is becoming more difficult, owing to the weaker tendency of prices, which tends to make consumers more conservative in releasing tonnage. Much sheet tonnage is moving to the automotive industry, but at prices lower than those at which the business was written, it having been necessary for local mills to revise prices to competitive levels to obtain specifications.

On automobile body sheets, 4c., base, is the current price. On black sheets, 2.80c., base, is the ruling level and while makers have encountered 2.75c., they say this usually is on special finishes based on the price of black sheets and carrying large enough extras to permit of some shading of base prices. Galvanized sheets commonly are quoted at 3.65c., base, but as low as 3.55c. has been reported from some districts. Mills here are trying to get 2c. to 2.10c., base, for blue annealed, but the higher figure is becoming exceptional and even less than 2c. is reported to general sales office from district offices, notably Detroit. These prices are lower than those quoted at the close of last year.

Standard-weight pipe business still is fairly active, but in oil country goods no improvement is noticed, and while makers are hopeful that the much-mentioned pipe line orders will soon be placed, they do not yet see any signs of definite action. There is good demand for tin plate and a good engagement of productive capacity in this area. The complaint of strip steel producers is not with volume but with the prices that are being obtained.

# St. Louis

## Pig Iron Sales Off—Scarcity in Fabricated Steel Orders

ST. LOUIS, May 1.—The pig iron market was quiet during the last week, sales of the St. Louis Gas & Coke Corporation totaling 1650 tons, while the leading Southern interest sold about 250 tons. The local maker's sales included 300 tons each to a district company and an Iowa melter and 200 tons to another Iowa company, with most shipments for second quarter and some into third quarter. The local furnace is accepting third quarter business on its present price of $19 per ton, f.o.b. Granite City. Southern makers, however, have not opened their books for third quarter, their price of $16, Birmingham, continuing for this quarter. Shipments for April by the local furnace exceed those for the corresponding month in 1927. Stove foundries are beginning to slow down, but the larger job foundries report good business.

*Prices per gross ton at St. Louis:*

| | |
|---|---|
| No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill. | $19.00 |
| Northern No. 2 fdy., delivered St. Louis | 20.66 |
| Southern No. 2 fdy., delivered | 20.42 |
| Northern malleable, delivered | 20.66 |
| Northern basic, delivered | 20.66 |

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

**Coke.**—The coke market is slow. Dealers have shown no interest in domestic grades. Nearly all foundry coke is being sold by local by-product ovens in small lots.

**Finished Iron and Steel.**—Fabricators of structural steel continue to complain of the scarcity of orders, the total volume for the week being less than 500 tons, including 150 tons for a municipal market. Demand for reinforcing bars is considerably better, with a far greater volume in sight. The principal business of the week was 475 tons for a hotel to Laclede Steel Co. Galvanized and lighter blue annealed sheets are in good demand. Warehouse business is slightly better.

**Old Material.**—The purchase of a fairly large tonnage of melting rails and specialties by an East Side mill, together with the inability of dealers to get sufficient melting and shoveling steel at last week's prices, has caused advances in these items. Heavy melting steel, heavy shoveling steel, rails for rolling and railroad malleable have advanced 25c. a ton, while miscellaneous rails, railroad springs, machine shop turnings, steel angle bars are up 50c. a ton, and No. 2 railroad wrought is 75c. higher. Railroad lists: Pennsylvania lines, 45,800 tons; Missouri Pacific, 400 tons; Frisco, 2000 tons; Chicago, Milwaukee & St. Paul, 1000 tons; Chicago & Alton, 700 tons of 80-lb. relaying rails.

*Prices per gross ton, f.o.b. dealers' yards and delivered St. Louis district consumers' works:*

| | |
|---|---|
| Heavy melting steel | $11.50 to $12.00 |
| No. 1 locomotive tires | 12.00 to 12.50 |
| Heavy shoveling steel | 11.50 to 12.00 |
| Miscellaneous standard-section rails, including frogs, switches and guards, cut apart | 12.50 to 13.00 |
| Railroad springs | 13.50 to 14.00 |
| Bundled sheets | 8.75 to 9.25 |
| No. 2 railroad wrought | 11.50 to 12.00 |
| No. 1 busheling | 9.50 to 10.00 |
| Cast iron borings | 8.75 to 9.25 |
| Iron rails | 13.00 to 13.50 |
| Rails for rolling | 13.00 to 13.50 |
| Machine shop turnings | 7.00 to 7.50 |
| Steel car axles | 17.50 to 18.00 |
| Iron car axles | 23.50 to 24.00 |
| Wrought iron bars and transoms | 21.00 to 21.50 |
| No. 1 railroad wrought | 10.00 to 10.50 |
| Steel rails, less than 3 ft | 15.00 to 15.50 |
| Steel angle bars | 12.00 to 12.50 |
| Cast iron carwheels | 13.00 to 13.50 |
| No. 1 machinery cast | 13.00 to 13.50 |
| Railroad malleable | 11.00 to 11.50 |
| No. 1 railroad cast | 13.00 to 13.50 |
| Stove plate | 12.00 to 12.50 |
| Agricultural malleable | 12.00 to 12.50 |
| Relaying rails, 60 lb. and under | 20.50 to 23.50 |
| Relaying rails, 70 lb. and over | 26.50 to 29.00 |

**Warehouse Prices, f.o.b. St. Louis**

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.25c. |
| Bars, soft steel or iron | 3.15c. |
| Cold-finished rounds, shafting and screw stock | 3.75c. |
| Black sheets (No. 24) | 4.45c. |
| Galvanized sheets (No. 24) | 5.25c. |
| Blue annealed sheets (No. 10) | 3.60c. |
| Black corrugated sheets (No. 24) | 4.50c. |
| Galvanized corrugated sheets | 5.30c. |
| Structural rivets | 3.75c. |
| Boiler rivets | 3.75c. |

| | Per Cent Off List |
|---|---|
| Tank rivets, ⅞-in. and smaller, 100 lb. or more | 70 |
| Less than 100 lb. | 65 |
| Machine bolts | 60 |
| Carriage bolts | 60 |
| Lag screws | 60 |
| Hot-pressed nuts, squares, blank or tapped, 200 lb. or more | 60 |
| Less than 200 lb. | 50 |
| Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more | 60 |
| Less than 200 lb. | 50 |

**Warehouse Prices, f.o.b. Cincinnati**

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.40c. |
| Bars, soft steel or iron | 3.30c. |
| New billet reinforcing bars | 3.15c. |
| Rail steel reinforcing bars | 3.00c. |
| Hoops | 4.00c. to 4.25c. |
| Bands | 3.95c. |
| Cold-finished rounds and hexagons | 3.85c. |
| Squares | 4.35c. |
| Black sheets (No. 24) | 4.05c. |
| Galvanized sheets (No. 24) | 4.90c. |
| Blue annealed sheets (No. 10) | 3.60c. |
| Structural rivets | 3.85c. |
| Small rivets | 65 per cent off list |
| No. 9 annealed wire, per 100 lb. | $3.00 |
| Common wire nails, base per keg | 2.95 |
| Cement coated nails, base 100 lb. keg | 2.95 |
| Chain, per 100 lb. | 7.55 |

| | Net per 100 Ft. |
|---|---|
| Lap-welded steel boiler tubes, 2-in. | $18.00 |
| 4-in. | 38.00 |
| Seamless steel boiler tubes, 2-in. | 19.00 |
| 4-in. | 39.00 |

# Cincinnati

## Pig Iron Buyers Show Little Interest —Steel Specifications Decline

CINCINNATI, May 1.—With enough pig iron on hand or contracted for to take care of second quarter requirements, consumers are showing practically no interest in buying for future needs. Aside from 1000 tons of Northern foundry for a Michigan melter and a like amount of charcoal iron also for Michigan delivery, sales have been confined to lots of 100 tons or single carloads. Southern Ohio foundry iron is quoted at $19, base Ironton, but that price is almost prohibitive, except in a limited area near the furnaces. Producers in northern Ohio are asking $16.50 to $17, base Cleveland, while Tennessee and Alabama irons are selling at $16, base Birmingham. Jackson County silvery iron is firm at $25, base furnace, for 8 per cent.

*Prices per gross ton, delivered Cincinnati:*

| | |
|---|---|
| So. Ohio fdy., sil. 1.75 to 2.25 | $20.89 |
| So. Ohio malleable | $20.14 to 20.89 |
| Alabama fdy., sil. 1.75 to 2.25 | 19.69 |
| Alabama fdy., sil. 2.25 to 2.75 | 20.19 |
| Tennessee fdy., sil. 1.75 to 2.25 | 19.69 |
| Southern Ohio silvery, 8 per cent | 26.89 |

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

**Coke.**—There has been a further recession in specifications for by-product foundry coke from companies allied with the automobile industry. Domestic grades, on the other hand, have been moving fairly well on account of the low prices which have encouraged dealers to build up stocks. Quotations of by-product foundry coke will remain at $7 per net ton, f.o.b. ovens, during May, while domestic coke also will be unchanged at $4.50, ovens, for egg, $3.50 for walnut and $3 for No. 2 nut. At Detroit, by-product foundry coke is selling at $8.50, Detroit ovens, for outside delivery and at $9, delivered in Detroit. Demand for beehive foundry coke from the Wise County and New River districts is light.

*Foundry coke prices per net ton, delivered Cincinnati:* By-product coke, $9.02; Wise County coke, $7.09 to $7.59; New River coke, $9.09 to $9.59. Freight rates, $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

**Finished Material.**—The amount of business placed with mills in the past week has been only fair, both specifications and fresh orders having declined somewhat. Structural steel is quiet, and new jobs are coming out more slowly than expected. Some small fabricators have a liberal volume of work on hand, but many large operators are in need of orders to keep their plants running on a normal basis. Bars, structural shapes and plates are selling generally at 1.85c., base Pittsburgh, to contract customers and at 1.90c. to occasional buyers. There is a noticeable tendency, however, to accept single carloads at 1.85c. In the sheet market the situation is much the same as a week ago. Orders for second quarter delivery are being placed at a good rate and the tonnage is well diversified. Specifications from automobile manufacturers are holding up satisfactorily, while the demand from the jobbing trade and from users of electrical sheets has been brisk. Mills are in position to supply the average run of material in from two to three weeks. Operations of district sheet manufacturers have continued close to full capacity with the same producing schedule holding over for the next week. Although there has been no strengthening of prices, quotations apparently are scraping bottom, and some large consumers are reported to be ready to put out inquiries for third quarter, hoping to take advantage of the present low prices to cover their needs up to Oct. 1. Blue annealed sheets range from 2c. to 2.10c., base Pittsburgh, with an occasional dip in the case of preferred customers. Galvanized stock remains at 3.65c. to 3.75c., base Pittsburgh, black sheets at 2.75c. to 2.85c. and automobile body sheets at 4c. Sales of common wire nails continue to reveal price irregularities, particularly at consuming points which can be reached from Ironton by barge down the Ohio River. Quotations are said to be from $2.50 to $2.55, base Ironton.

**Warehouse Business.**—Sales in April were fairly good in volume, but the tonnage in the aggregate was less than normal. There has been no change in prices.

**Reinforcing Bars.**—New billet bars are priced at 1.85c. to 1.90c., base Pittsburgh, and rail steel bars at 1.80c., base mill.

**Old Material.**—Heavy melting steel has dropped 50c. a ton, while sheet clips and bundled sheets are off 25c. Consumers are buying only in small quantities to cover immediate needs. Little scrap is coming onto the market. Steel plants are accepting moderate tonnages on contracts.

*Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:*

| | |
|---|---|
| Heavy melting steel | $11.00 to $11.50 |
| Scrap rails for melting | 11.25 to 11.75 |
| Loose sheet clippings | 8.25 to 8.75 |
| Bundled sheets | 9.25 to 9.75 |
| Cast iron borings | 8.00 to 8.50 |
| Machine shop turnings | 7.50 to 8.00 |
| No. 1 busheling | 10.00 to 10.50 |
| No. 2 busheling | 7.00 to 7.50 |
| Rails for rolling | 12.50 to 13.00 |
| No. 1 locomotive tires | 12.75 to 13.25 |
| No. 1 railroad wrought | 10.00 to 10.50 |
| Short rails | 15.75 to 16.25 |
| Cast iron carwheels | 12.25 to 12.75 |
| No. 1 machinery cast | 15.50 to 16.00 |
| No. 1 railroad cast | 13.00 to 13.50 |
| Burnt cast | 7.50 to 8.00 |
| Stove plate | 8.25 to 8.75 |
| Brake shoes | 9.50 to 10.25 |
| Railroad malleable | 12.00 to 12.50 |
| Agricultural malleable | 11.50 to 12.00 |

# Boston

## Pig Iron Dull—Sales for Week 4000 Tons—Machinery Cast Scrap Higher

BOSTON, May 1.—May opens with comparatively little pig iron business in sight. The foundries which have been sounding out the market have not as yet given indications that they will buy soon. Current activity centers largely in rounding up scattered third quarter orders. New England sales the past week slightly exceeded 4000 tons, the Mystic Iron Works taking almost half, with eastern New York State, Buffalo and other irons making up the remainder. One of the largest sales was 500 tons of No. 2X to a Massachusetts machinery maker at a price reported as not more than $20.15 a ton, delivered.

*Prices of foundry iron per gross ton, delivered to most New England points:*

| | |
|---|---|
| Buffalo, sil. 1.75 to 2.25 | $20.91 to $21.91 |
| Buffalo, sil. 2.25 to 2.75 | 21.41 to 22.41 |
| East. Penn., sil. 1.75 to 2.25 | 23.15 to 23.65 |
| East. Penn., sil. 2.25 to 2.75 | 23.65 to 24.15 |
| Virginia, sil. 1.75 to 2.25 | 25.71 |
| Virginia, sil. 2.25 to 2.75 | 26.21 |
| Alabama, sil. 1.75 to 2.25 | 22.91 to 24.77 |
| Alabama, sil. 2.25 to 2.75 | 23.41 to 25.27 |

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

**Warehouse Prices, f.o.b. Boston**

| | Base per Lb. |
|---|---|
| Plates | 3.365c. |
| Structural shapes— | |
| Angles and beams | 3.365c. |
| Tees | 3.365c. |
| Zees | 3.465c. |
| Soft steel bars and small shapes | 3.265c. |
| Flats, hot-rolled | 4.15c. |
| Reinforcing bars | 3.265c. to 3.54c. |
| Iron bars— | |
| Refined | 3.265c. |
| Best refined | 4.60c. |
| Norway, rounds | 6.60c. |
| Norway, squares and flats | 7.10c. |
| Spring steel— | |
| Open-hearth | 5.00c. to 10.00c. |
| Crucible | 12.00c. |
| Tire steel | 4.50c. to 4.75c. |
| Bands | 4.015c. to 5.00c. |
| Hoop steel | 5.50c. to 6.00c. |
| Cold rolled steel— | |
| Rounds and hexagons | *3.45c. to 5.45c. |
| Squares and flats | *3.95c. to 6.95c. |
| Toe calk steel | 6.00c. |
| Rivets, structural or boiler | 4.50c. |

| | Per Cent Off List |
|---|---|
| Machine bolts | 50 and 5 |
| Carriage bolts | 50 and 5 |
| Lag screws | 50 and 5 |
| Hot-pressed nuts | 50 and 5 |
| Cold-punched nuts | 50 and 5 |
| Stove bolts | 70 and 10 |

*Including quantity differentials.

**Coke.**—The New England Coal & Coke Co. and the Providence Gas Co. have announced that the May price of by-product foundry coke will remain at $11 a ton, delivered within a $3.10 freight rate zone, the same as in April. The reduction in New England fuel last month failed to stimulate foundry buying to any appreciable extent. Makers of coke outside of New England are pressing sales here at prices about equivalent to $11 a ton, delivered.

**Cold-Rolled Strip.**—Although the market is not active, there is increased buying of cold-rolled strip. Demand is on a hand-to-mouth basis, but broader owing to the fact that runover deliveries from the first quarter have been pretty well cleaned up. There has been some shading in prices. The American Steel & Wire Co. continues to quote 3.15c. to 3.30c., base Worcester, Mass., on 1 to 3-ton lots.

**Warehouse Business.**—Average April warehouse sales in this territory were 10 to 20 per cent larger than those for April, 1927, but 5 to 8 per cent smaller than those for March, this year. Stocks are comparatively small and more or less broken. Competition for business remains keen, yet prices are steady.

**Old Material.**—Exporters who sold heavy melting steel scrap for export to Danzig are having difficulty in filling their orders at the prices paid, namely, $7.50 and $7.75, delivered on dock. Owing to the fact that automobile rims and other objectionable material have been shipped, rejections have been made freely. One shipper reports that nine of 13 cars shipped were rejected. This, together with the fact that some of the eastern Pennsylvania steel plants are holding back shipments of steel scrap, has weakened the market here. Sales of heavy melting steel were made in the past week at $9 and $9.10 on cars, shipping point, indicating a little softness. No. 1 machinery cast, which is scarce, is held at slightly higher prices. Textile cast, on the other hand, is plentiful.

*Buying prices per gross ton f.o.b. Boston rate shipping points:*

| | |
|---|---|
| No. 1 heavy melting steel | $9.00 to $9.50 |
| Scrap T rails | 8.50 to 9.00 |
| Scrap girder rails | 7.50 to 8.00 |
| No. 1 railroad wrought | 10.00 to 10.25 |
| No. 1 yard wrought | 7.50 to 8.00 |
| Machine shop turnings | 5.50 to 5.75 |
| Cast iron borings (steel works and rolling mill) | 6.00 to 6.25 |
| Bundled skeleton, long | 5.75 to 6.25 |
| Forge flashings | 6.60 to 7.25 |
| Blast furnace borings and turnings | 5.75 to 6.25 |
| Forge scrap | 6.00 to 6.50 |
| Shafting | 13.00 to 13.50 |
| Steel car axles | 15.50 to 16.00 |
| Wrought pipe (1 in. in diameter, over 2 ft. long) | 7.50 to 8.00 |
| Rails for rolling | 10.00 to 10.25 |
| Cast iron borings, chemical | 9.50 to 10.00 |
| *Prices per gross ton delivered consumers' yards:* | |
| Textile cast | $13.50 to $14.00 |
| No. 1 machinery cast | 15.25 to 15.50 |
| No. 2 machinery cast | 13.50 to 14.00 |
| Stove plate | 10.00 to 10.50 |
| Railroad malleable | 13.00 to 13.50 |

## To Investigate Cost of Tungsten Output

WASHINGTON, May 1.—The metals section of the Tariff Commission will begin field work soon in connection with an investigation concerning the differences in costs of production of tungsten in the United States and China. The study was directed by a resolution introduced by Senator Oddie of Nevada and passed last week. China was named as the chief competing country. The investigation is to be made under Section 315 (flexible provision) of the tariff act. Costs concerning production in China will be ascertained from invoices and other documents, and no representative of the commission will be sent to that country.

Average cargo analyses of Lake Superior ores shipped during 1927 are shown in an annual analysis book issued by the Lake Superior Iron Ore Association, Union Trust Building, Cleveland. Analyses are given for all mines from which shipments were made and include the percentage of iron (both dried and natural), phosphorus, silica, manganese, sulphur and other components, and the percentage of moisture in the natural ore.

## Bethlehem Plants Better Previous Safety Records

Marked improvement in accident prevention was effected by the employees of the Bethlehem Steel Corporation during the first quarter of this year, according to the corporation's safety report. The corporation as a whole improved its best previous record by 17.8 per cent. The steel plants alone bettered their safety record by 44 per cent.

This was the first quarter of the 1928 accident prevention contest for gold money awards to Bethlehem employees, announced on Jan. 3 by President E. G. Grace. In this contest three prizes of $1,000, $500 and $250 in gold are awarded each quarter to the three groups of employees which make the greatest reduction in lost time due to accidents. For purposes of the contest the 70,000 employees are divided into 11 groups.

In the first quarter the Maryland plant group won first prize of $1,000 with an improvement in its safety record of 70.3 per cent, the Steelton plant group won the second prize with a 62.4 per cent improvement and the Bethlehem plant group won third prize, bettering its safety record by 59.8 per cent.

## Chamber of Commerce of United States to Meet May 7 to 11

WASHINGTON, May 1.—The Chamber of Commerce of the United States will hold its annual meeting in Washington May 7 to 11. Commercial aviation, commercial arbitration, agriculture, the Federal Trade Commission, foreign trade, highways, immigration, merchant marine, taxation, trust legislation, water power and the World Court will be discussed. At a meeting of the department of manufacture of the chamber in the large ballroom of the New Willard Hotel on May 9 the following addresses will be given: "Teamwork for Profits in a Consumers' Market," E. J. Mehren, vice-president McGraw-Hill Publishing Co., Inc.; "Forecasting and Planning—Vital to Industrial Prosperity," Donald Brown, vice-president General Motors Corporation, and "Labor Conservation—Teamwork for Lower Costs of Production," C. S. Ching, president American Management Association. There will be discussion of the addresses, and resolutions will be adopted. The meeting will be preceded by luncheon at 1 o'clock.

## Will Study Marketing and Distribution Methods

National marketing and distribution methods and related problems are to be studied, with cooperation from large manufacturers and distributers, under the direction of the bureau of foreign and domestic commerce, Department of Commerce, Washington. The nation-wide survey, which will fit in with regional surveys now under way and to be taken up, has been ordered by Julius Klein, director of the bureau, and the work will be in charge of John M. Hager, who during the period of organization has been director of market survey of the department's domestic commerce division. Mr. Hager will begin his work in New York, extending his operations to other parts of the country later. It is expected the greater part of the current year will be occupied by the task.

The Interstate Commerce Commission has set May 10 as the date for hearing on the application of the Pittsburgh, Lisbon & Western Railroad for authority to build a new line which would traverse Mahoning and Columbiana counties in Ohio and Beaver County in Pennsylvania and connect the Youngstown district with the Ohio River.

Directors of the Sheffield Steel Corporation, Kansas City, Mo., have declared a 33⅓ per cent stock dividend, payable July 1, to stock of record June 15.

# NON-FERROUS METAL MARKETS

**The Week's Prices**

Cents per Pound for Early Delivery

| | May 1 | Apr. 30 | Apr. 28 | Apr. 27 | Apr. 26 | Apr. 25 |
|---|---|---|---|---|---|---|
| Lake copper, New York | 14.25 | 14.25 | 14.25 | 14.25 | 14.25 | 14.25 |
| Electrolytic copper, N. Y.* | 14.00 | 14.12½ | 14.12½ | 14.12½ | 14.12½ | 14.12½ |
| Straits tin, spot, N. Y. | 51.12½ | 51.00 | .... | 52.12½ | 51.87½ | 52.25 |
| Lead, New York | 6.10 | 6.10 | 6.10 | 6.10 | 6.10 | 6.10 |
| Lead, St. Louis | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 |
| Zinc, New York | 6.20 | 6.15 | 6.15 | 6.15 | 6.15 | 6.15 |
| Zinc, St. Louis | 5.85 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 |

*Refinery quotation; delivered price ¼c. higher

NEW YORK, May 1.—All the markets are devoid of features. Buying of copper is very light, but prices are firmer. A fair business in tin is reported at a lower price level. Lead is unchanged both as to demand and quotations, but zinc values are tending higher.

**Copper.**—Very little buying by domestic consumers is reported and not much metal is any longer available at a concession from the quotation of 14.25c., delivered in the Connecticut Valley, which practically all electrolytic producers are firmly adhering to. Sales for export have been fairly large the past week, running as high as about 5000 tons on one day. The quotation of Copper Exporters, Inc., is still unchanged at 14.50c., c.i.f. European ports. It is believed that domestic consumers are fairly well covered for May, but that foreign users must still buy considerable for that position. Consumption throughout April was very heavy and keeps up, mills still being urged for deliveries. Opinion is expressed that statistics for April will show a large increase in consumption and a decrease in stocks. Lake copper continues moderately active and firm at 14.25c., delivered, as the minimum.

**Copper Averages.**—The average price for Lake copper for the month of April, based on daily quotations in THE IRON AGE, was 14.26c., delivered. The average price of electrolytic copper was 14.25c., delivered.

**Tin.**—Sales for the week have been light at about 1000 tons, dealers being the principal buyers for May-June delivery. In the last week more interest in the July position was in evidence. Yesterday, Monday, the market was quite active, with 400 to 500 tons changing hands, dealers again being the principal buyers. For the most part consumers show little interest. A shortage in May, which was mentioned a week ago as possible, has been to some extent eliminated because more metal is being shipped than was expected. A steamer is due on May 21, bearing 1070 tons, which will probably all be delivered into consumption this month. Statistics for April show that deliveries into consumption in the United States in April were 7010 tons, with 1973 tons in stock and landing on April 30. Shipments from the Straits in April were 6774 tons and the May shipments are estimated at about 7250 tons. The decrease in the visible supply for April was 585 tons, or less than expectations, which placed it at nearer 1000 tons. The visible supply on May 1 is placed at 15,001 tons. The market today was only moderately active, with Straits tin quoted at 51.12½c., New York. Prices in London today were about £3 to £4 per ton less than a week ago, with spot standard quoted at £229 15s., future standard at £230 2s. 6d. and spot Straits at £234 5s. The Singapore price today was £233 5s.

**Lead.**—Just enough business is being done each day to maintain firmly the prices which have prevailed for about a month both here and in the West. The leading interest continues to maintain its quotation at 6.10c., New York, as the contract price, and in the outside market 6c., East St. Louis, prevails.

**Zinc.**—Hardly enough business is reported to establish a market, and opinions as to the price at which prime Western zinc can be bought vary considerably. For most of the week the quotation has been 5.80c. to 5.82½c., East St. Louis, but today the metal can probably not be bought for less than 5.85c. The fact that the price for ore at $38 per ton, Joplin, does not permit of a profit at present quotations for the metal causes producers to be extremely backward in making sales. About 9000 tons of ore was sold last week, with production at about 10,000 tons.

### Metals from New York Warehouse

*Delivered Prices Per Lb.*

| | |
|---|---|
| Tin, Straits pig | 53.50c. to 54.50c. |
| Tin, bar | 56.00c. to 57.00c. |
| Copper, Lake | 15.25c. |
| Copper, electrolytic | 15.00c. |
| Copper, casting | 14.25c. |
| Zinc slab | 7.00c. to 7.50c. |
| Lead, American pig | 7.00c. to 7.50c. |
| Lead, bar | 9.25c. to 10.25c. |
| Antimony, Asiatic | 12.00c. to 12.50c. |
| Aluminum No. 1 ingots for remelting (guaranteed over 99 per cent pure) | 25.00c. to 26.00c. |
| Aluminum ingots, No. 12 alloy | 24.00c. to 25.00c. |
| Babbitt metal, commercial grade | 30.00c. to 40.00c. |
| Solder, ½ and ½ | 34.00c. to 35.00c. |

### Metals from Cleveland Warehouse

*Delivered Prices Per Lb.*

| | |
|---|---|
| Tin, Straits pig | 56.50c. |
| Tin, bar | 58.50c. |
| Copper, Lake | 14.85c. |
| Copper, electrolytic | 14.85c. |
| Copper, casting | 14.00c. |
| Zinc, slab | 7.50c. |
| Lead, American pig | 6.95c. |
| Antimony, Asiatic | 16.00c. |
| Lead, bar | 9.25c. |
| Babbitt metal, medium grade | 18.50c. |
| Babbitt metal, high grade | 60.50c. |
| Solder, ½ and ½ | 32.75c. |

### Rolled Metals from New York or Cleveland Warehouse

*Delivered Prices, Base Per Lb.*

| | |
|---|---|
| *Sheets—* | |
| High brass | 18.50c. to 19.25c. |
| Copper, hot rolled | 23.00c. to 24.00c. |
| Copper, cold rolled, 14 oz. and heavier, | 25.50c. to 26.50c. |
| *Seamless Tubes—* | |
| Brass | 23.37½c. to 24.37½c. |
| Copper | 24.50c. to 25.50c. |
| *Brazed Brass Tubes* | 26.50c. to 27.50c. |
| *Brass Rods* | 16.25c. to 17.25c. |

**From New York Warehouse**

*Delivered Prices, Base Per Lb.*

| | |
|---|---|
| *Zinc sheets (No. 9), casks* | 9.50c. to 10.00c. |
| *Zinc sheets, open* | 10.50c. to 11.00c. |

## Non-Ferrous Rolled Products

Zinc sheets have been advanced ½c. per lb., and are now being quoted at 9c., base. Mill quotations on bronze, brass and copper products and on lead full sheets have not been changed.

### List Prices, Per Lb., f.o.b. Mill

*On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over*

| | |
|---|---|
| *Sheets—* | |
| High brass | 18.75c. |
| Copper, hot rolled | 23.00c. |
| Zinc | 9.00c. |
| Lead (full sheets) | 9.75c. to 10.00c. |
| *Seamless Tubes—* | |
| High brass | 23.62½c. |
| Copper | 24.50c. |
| *Rods—* | |
| High brass | 16.50c. |
| Naval brass | 19.25c. |
| *Wire—* | |
| Copper | 16.00c. |
| High brass | 19.25c. |
| *Copper in Rolls* | 22.00c. |
| *Brazed Brass Tubing* | 26.75c. |

**Aluminum Products in Ton Lots**

*The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.*

| | |
|---|---|
| Sheets, 0 to 10 gage, 3 to 30 in. wide | 33.00c. |
| Tubes, base | 42.00c. |
| Machine rods | 34.00c. |

### Rolled Metals, f.o.b. Chicago Warehouse

*(Prices Cover Trucking to Consumers' Doors in City Limits)*

| | Base per Lb. |
|---|---|
| *Sheets—* | |
| High brass | 18.75c. |
| Copper, hot rolled | 22.75c. |
| Copper, cold rolled, 14 oz. and heavier | 25.00c. |
| Zinc | 10.00c. |
| Lead, wide | 9.75c. |
| *Seamless Tubes—* | |
| Brass | 25.12½c. |
| Copper | 26.00c. |
| *Brazed Brass Tubes* | 26.75c. |
| *Brass Rods* | 16.50c. |

**Nickel.**—Wholesale lots of ingot nickel are quoted unchanged at 35c., with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

**Antimony.**—Buying by dealers has been quite active and Chinese metal for all positions is quoted a little higher at 10.50c., New York, duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

### Non-Ferrous Metals at Chicago

CHICAGO, May 1.—In a market characterized by light and spotty buying, prices for copper have advanced, while quotations for tin, lead and zinc have dropped to lower levels. The old metal market was moderately active early in the week, but since that time it has been quiet.

*Prices, per lb., in carload lots:* Lake copper, 14.37½c.; tin, 52.75c.; lead, 6.10c.; zinc, 5.90c.; in less-than-carload lots, antimony, 11.75c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.25c.; pewter, No. 1, 30c.; tin foil, 36c.; block tin, 45c.; aluminum, 11.75c.; all being dealers' prices for less-than-carload lots.

## RAILROAD EQUIPMENT

### Erie Inquires for 1000 Freight Cars—500 Refrigerator Cars Bought

FEATURING the equipment market this week were inquiries by the Erie for 1000 freight and 35 passenger cars and an order from the Northwestern Refrigerator Line for 500 refrigerator cars and 100 underframes. The Erie will also make repairs to 2485 box cars. Locomotive purchases included 10 for the Southern Pacific, in addition to those mentioned last week. Details of the week's business follow:

Northwestern Refrigerator Line has purchased 500 40-ton refrigerator cars and 100 refrigerator car underframes from American Car & Foundry Co.

Chicago, Rock Island & Pacific has ordered 500 box car underframes from Pennsylvania Car Co.

Tampagna Sugar Development Co., Philippine Islands, has ordered two Mogul-type locomotives from Baldwin Locomotive Works.

Erie Railroad has made inquiry for 25 passenger coaches, three combination baggage and mail cars, five express and two dining cars. This road is also inquiring for 500 40-ton box cars, 400 40½-ft. automobile furniture cars, 100 50-ft. automobile furniture cars and five 100-ton depressed flat cars. Repairs will also be made to 2485 box cars.

Chicago, Milwaukee, St. Paul & Pacific is inquiring for two flat cars instead of five as reported last week.

Chicago, South Shore & South Bend has made inquiry for 10 motor coaches, with option on five additional, and five trailers.

Delaware, Lackawanna & Western has ordered one combination baggage and mail car from American Car & Foundry Co.

United Sugar Co. of Mexico is inquiring for 10 cane cars.

St. Louis-San Francisco has purchased 250 underframes from Virginia Bridge & Iron Co., and will buy two underframes and superstructures for automobile cars.

Southern Cotton Oil Co., Savannah, Ga., will purchase 20 tank cars.

Southern Pacific has purchased 10 locomotives from Baldwin Locomotive Works, in addition to those mentioned last week, and is inquiring for 50 caboose, six dining and 10 street cars.

Consolidated Coal Co. has ordered 150 coal cars from Bethlehem Steel Co.

Great Northern has purchased two electric locomotives from Baldwin Locomotive Works.

### Old Metals, Per Lb., New York

*The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.*

| | Dealers' Buying Prices | Dealers' Selling Prices |
|---|---|---|
| Copper, heavy crucible | 12.00c. | 13.50c. |
| Copper, heavy and wire | 11.75c. | 12.875c. |
| Copper, light and bottoms | 10.25c. | 11.375c. |
| Brass, heavy | 7.00c. | 8.50c. |
| Brass, light | 6.00c. | 7.50c. |
| Heavy machine composition | 9.50c. | 10.625c. |
| No. 1 yellow brass turnings | 7.75c. | 9.00c. |
| No. 1 red brass or composition turnings | 8.75c. | 9.75c. |
| Lead, heavy | 5.00c. | 5.50c. |
| Lead, tea | 4.00c. | 4.50c. |
| Zinc | 3.00c. | 3.50c. |
| Sheet aluminum | 12.50c. | 14.50c. |
| Cast aluminum | 12.50c. | 14.00c. |

## REINFORCING STEEL

### Awards of 8500 Tons—Only 1250 Tons in New Projects

AWARDS of 8500 tons reported to THE IRON AGE during the week, the largest of which were 1000 tons each for a bridge at Allentown, Pa., and an office building in Chicago. New projects amounted to only 1250 tons, the lowest total of the year thus far. Awards follow:

NEW YORK, 500 tons, section of subway; from Corson Construction Co., general contractor, to Truscon Steel Co.

NEW YORK, 480 tons, loft building at Varick and Dominick Streets, to Truscon Steel Co.

HACKENSACK, N. J., 175 tons, sewer project, to Concrete Steel Co.

PHILADELPHIA, 900 tons, Pennsylvania Railroad cold storage warehouse, to A. Taylor & Co., local.

ALLENTOWN, PA., 1000 tons, Tilghman Street bridge, to Concrete Steel Co.

BUFFALO, 100 tons, addition to plant of Eastern States Milling Co., to a local maker.

BUFFALO, 200 tons, high school stadium, to local maker.

GARY, IND., 100 tons, building for Illinois Bell Telephone Co., to Concrete Steel Co.

CHICAGO, 400 tons of rail steel bars, building for Nu-Art Engraving Co., to Inland Steel Co.

CHICAGO, 100 tons, building for Borland Mfg. Co., to Barton Spiderweb System.

CHICAGO, 500 tons, Woolworth Building, to Kalman Steel Co.

CHICAGO, 170 tons, temporary building for Board of Trade.

CHICAGO, 1000 tons, *Daily News* building, to an unnamed bidder.

CHICAGO, 700 tons of rail steel, apartment building; Wahl Construction Co., builder, to an unnamed bidder.

AURORA, ILL., 350 tons, reservoir, to an unnamed bidder.

STATE OF ILLINOIS, 700 tons of rail steel bars for road work; 200 tons to Calumet Steel Co., 200 tons to Olney J. Dean Co. and 300 tons to Concrete Engineering Co.

STATE OF ILLINOIS, 900 tons, highway bridges; five to A. C. Wood, Rockford, Ill., one to Hansell-Elcock Co., Chicago, and two to Continental Bridge Co., Chicago.

ST. LOUIS, 475 tons, Lennox Hotel at Ninth and Washington Avenues, to Laclede Steel Co.

SEATTLE, 100 tons, addition to Virginia Hospital, to Pacific Coast Steel Co.

SALT LAKE CITY, 155 tons, paving Mount Carmel highway, to unnamed company.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 500 tons, abutments for Hudson River bridge; Arthur McMillen Co., general contractor.

BUFFALO, 100 tons, extension to express building of New York Central Railroad; bids asked.

BUFFALO, 300 tons, school No. 81; being figured.

CHICAGO, tonnage being estimated, 11-story garage building, for Glen E. Holmes, Inc.

CHICAGO, tonnage not stated, building for Illinois Bell Telephone Co.

CHICAGO, 800 tons, approaches to Crawford Avenue bridge; Underground Construction Co., general contractor.

ST. LOUIS, 200 tons, Knights of Pythias building, Grand and Delmar Boulevards.

SEATTLE, 155 tons, piers for West Waterway bridge; bids May 18.

## FABRICATED STRUCTURAL STEEL

### Two Bridge Projects Take 10,300 Tons—Milwaukee Court House Will Require 6000 Tons

INCLUDING 5500 tons for a railroad bridge at Newark, N. J., 4800 tons for additional work on the Hudson River bridge at New York and 3500 tons for plant additions at Moline, Ill., and Waterloo, Iowa, structural awards amounted to 29,000 tons. New projects totaled 14,000 tons, the largest being a court house at Milwaukee requiring 6000 tons. Awards follow:

STATE OF VERMONT, 553 tons, bridges at North Enosburg, East Highgate, North Sheldon and Sheldon Springs, to Lackawanna Steel Construction Co., Buffalo.

MIDDLESEX, VT., 366 tons, four bridges, to Palmer Steel Co.

WATERBURY, VT., 150 tons, bridges, to Bethlehem Steel Co.

BOSTON, 160 tons additional, Sears, Roebuck & Co., to New England Structural Co.

STATE OF NEW HAMPSHIRE, 400 tons, three bridges, to American Bridge Co.

BOSTON & MAINE RAILROAD, 300 tons, two bridges, to Boston Bridge Works, Inc.

NEW YORK, 1500 tons, loft building on East Forty-fifth Street, to Harris Structural Steel Co.

NEW YORK, 4800 tons, Hudson River bridge, in connection with wire cable work to be done by John Roebling's Sons Co.

STATE OF NEW YORK, 286 tons, highway bridges; 125 tons to Bethlehem Steel Co., and 161 tons to McClintic-Marshall Co.

NEWARK, N. J., 5500 tons, bridge over Newark Bay for Pennsylvania Railroad, to Bethlehem Steel Co.

WEST END, N. J., 1000 tons, H. T. Parson residence, to Hedden Iron Construction Co.

PHILADELPHIA, 350 tons, mill building for Edward Russ, to Belmont Iron Works.

PHILADELPHIA 2500 tons, apartment building on Spruce Street, to Bethlehem Steel Co.

BALTIMORE, 318 tons, plates for 80,000-gal. tank for American Oil Co. at Curtis Bay, to Riter-Conley Co.

WATERVILLE, N. C., 800 tons, hydroelectric station, to Virginia Bridge & Iron Co.

CHARLESTON, W. VA., 120 tons, Montgomery Ward & Co. building, to Massillon Bridge & Structural Co.

BIRMINGHAM, 200 tons, Crawford Auto Shop, to Southern Steel Works.

PITTSBURGH, 100 tons, slag brick plant for Duquesne Slag Products Co., to Jones & Laughlin Steel Corporation.

PITTSBURGH, 450 tons, mill building, Crucible Steel Co. of America, to Fort Pitt Bridge Works.

EAST LIVERPOOL, OHIO, 230 tons, foundry building, to unnamed fabricator.

DAYTON, OHIO, 150 tons, W. T. Grant residence, to Massillon Bridge & Structural Co.

STATE OF MICHIGAN, 190 tons, road work, to Massillon Bridge & Structural Co.

STICKNEY, ILL., 200 tons, building for Sanitary District, to Midland Structural Steel Co., Chicago.

CHICAGO, 700 tons, Temple Sholem, to Midland Structural Steel Co., local.

CHICAGO, 300 tons, church and school, to A. Bolter's Sons.

MINNEAPOLIS, 2000 tons, Foshay Tower, to Minneapolis Steel & Machinery Co.

MINNEAPOLIS, 1100 tons, building for Northern States Power Co., to Minneapolis Steel & Machinery Co.

MOLINE, ILL., AND WATERLOO, IOWA, 3500 tons, additions to plants of Deere & Co., to Rochester Bridge Co., Rochester, Ind.

ST. LOUIS SOUTHWESTERN RAILWAY, 200 tons, bridge at Garland City, Ark., to unnamed fabricator.

BELLINGHAM, WASH., 100 tons, standpipe, to Chicago Bridge & Iron Works.

COBURG, ORE., 220 tons, bridge over McKenzie River, to Portland Bridge Co.

BODIE, CAL., 100 tons, headframe for Clinton West Co., to Moore Dry Dock Co.

LOS ANGELES, 158 tons, hotel, Lake and Eighth Streets, to Union Iron Works.

#### Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON & MAINE RAILROAD, 1000 tons, two highway bridges.

STATE OF NEW YORK, 250 tons, highway bridge.

JERSEY CITY, 250 tons, St. Francis Hospital.

DOVER, N. J., 200 tons, United States Government building at Piccatinny Arsenal.

PENNSYLVANIA RAILROAD, 1000 tons, bridges.

WILMINGTON, DEL., 850 tons, bridge; Fredrich Snare Corporation, general contractor; Phoenix Bridge Works, low bidder on steel erected.

BALTIMORE, 800 tons, highway bridge.

MEMPHIS, 625 tons, six sand barges for Mississippi River Commission.

CLEVELAND, 400 tons, two junior high schools.

CLEVELAND HEIGHTS, 100 tons, Canterbury School.

DETROIT, 150 tons, office and service building for White Motor Co.

ERIE, PA., 275 tons, Erie County bridges; bids taken.

JOLIET, ILL., 250 tons, store.

CHICAGO, 200 tons, building at Ohio and North Michigan Boulevards; Phillip Maher, architect.

CHICAGO, 250 tons, store at 226 South Wabash Avenue.

CHICAGO, 200 tons, store at 234 South Wabash Avenue.

CHICAGO, 250 tons, building for Link-Belt Co.

MILWAUKEE, 6000 tons, Court House.

ST. LOUIS, 150 tons, Soulard market for Board of Public Service.

TACOMA, WASH., 115 tons, plates for 48-in. riveted pipe; bids April 30.

OAKLAND, CAL., 4830 tons, plates, Wildcat aqueduct, East Bay Municipal Utility District; Steel Tank & Pipe Co., low bidder.

OAKLAND, 3668 tons, plates, Sequoia aqueduct, East Bay Municipal Utility District; Steel Tank & Pipe Co., low bidder.

OAKLAND, 400 tons, Twentieth Century Market; bids being taken.

OAKLAND, 380 tons, warehouse, foot of Fourteenth Street; Herrick Iron Works, low bidder.

RICHMOND, CAL., 300 tons, warehouse for Parr Terminal Co.; bids received.

SAN FRANCISCO, 120 tons, addition to warehouse, Vermont and Fifteenth Streets; bids being taken.

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## OBITUARY

NICOLAY NELSON, founder of the Nelson Machine Works, Waukegan, Ill., died, April 17. He was born in Norway. He and his son founded the Nelson Machine Works 22 years ago.

—

WILLIAM U. DENNISON, superintendent of construction for the Carnegie Steel Co. in the Youngstown district and builder of the McDonald plant of the company at McDonald, Ohio, died suddenly, April 21, aged 64 years. He had been with the Carnegie company for 27 years.

—

WILLIAM F. LANE, general superintendent of the Girard works, A. M. Byers Co., Girard, Ohio, died suddenly April 21, in a Youngstown hospital, aged 58 years. He had been connected with the Girard plant of the Byers company since 1909, for the first five years as superintendent of the furnace department and since 1914 as superintendent of the property.

—

JOHN A. KITTILSEN, vice-president K. I. Willis Corporation, Moline, Ill., died at his home in that city on April 16, following a year's illness. He was 68 years of age and was identified for 29 years with the Moline Scale Co. before becoming one of the organizers of the Willis organization.

—

JAMES C. ARMSTRONG, proprietor of the former Armstrong Machine Works, Peoria, Ill., and a pioneer in foundry work in central Illinois, died on April 20. He was 82 years of age and had retired from active business several years ago.

—

C. LEE COOK, head of the C. Lee Cook Co., Louisville, Ky., manufacturer of metallic steam packing and steam specialties, died on April 25 of pneumonia. He was 57 years of age and had been physically incapacitated since infancy. He was widely known as an inventor and was also prominently identified in civic and artistic circles of Louisville.

# PERSONAL

John E. Woods, assistant general manager of sales Carnegie Steel Co., has retired after almost 41 years' association with the company. His successor is Joseph C. Shields, who has been his assistant. Mr. Woods started in the steel business in August, 1887, as a time

JOHN E. WOODS

JOSEPH C. SHIELDS

clerk at the Homestead steel works. He was manager of sales in Cincinnati prior to his appointment as assistant general manager of sales. He was born in Washington, Pa., Dec. 17, 1867, and is a graduate of Washington and Jefferson College. Mr. Shields' entire business career has been in the steel business and with the Carnegie Steel Co., with which he started as an office boy in the order and shipping department Sept. 15, 1897. Later he became shape schedule clerk, then chief clerk with the general sales department, and in December, 1917, he was made assistant to Mr. Woods.

—

James E. Lose has been appointed assistant general superintendent Homestead works, Carnegie Steel Co., succeeding Ralph H. Watson, recently advanced to the general superintendency of that works. Mr. Lose has been identified with the company since 1910, continuously at the Carrie furnaces, which supply pig iron to the Homestead works. He was born in Kansas, but attended the grade and high schools in Pittsburgh, where he also took a year's course in special mathematics at Pittsburgh Academy and four years' mechanical engineering course at the Carnegie Institute of Technology. He started as a tracer in the drawing room at Carrie furnaces and successively served as draftsman, stock house foreman, superintendent of construction, assistant superintendent of blast furnaces, and finally as superintendent of blast furnaces, assuming the latter position in September, 1924. He presented a paper, "Operation of Large Hearth Furnaces," at the 1927 spring meeting of the American Iron and Steel Institute. He is a member of this institute and also of the Eastern States Blast Furnace and Coke Oven Association.

—

Homer D. Williams, president Pittsburgh Steel Co., Pittsburgh, accompanied by his bride, has gone to California for a month's visit.

—

B. E. Kibbee, who has been general manager of sales for the Sharon Steel Hoop Co., Sharon, Pa., has been made vice-president of the company, succeeding H. T. Gilbert, recently elected vice-president Republic Iron & Steel Co. Mr. Kibbee will be succeeded by A. S. Booth, who has been assistant general manager of sales for the Sharon company.

—

Arthur H. Hawkins, recently district representative at Memphis, Tenn., for the Granite City Steel Co., Granite City, Ill., has been transferred to Dallas, Tex., where he will serve the company in a similar capacity. Before going with the Granite City company he was associated with the various subsidiary companies of the United States Steel Corporation at Denver, Colo. Richard W. Orthwein, who has been connected with the Granite City company for a number of years, will succeed Mr. Hawkins as Memphis representative.

—

Allen E. Hall, manager of the sawmill machinery department, Allis-Chalmers Mfg. Co., Milwaukee, has been appointed a member of the National Committee on Wood Utilization of the Department of Commerce by Secretary Hoover, chairman. He represents the American Society of Mechanical Engineers. The endeavor of the committee is to reduce waste in the production and manufacture of lumber.

—

A. C. Perrin, formerly associated with Joseph T. Ryerson & Son, Inc., Chicago, has joined the sales organization of the Stocker-Rumely-Wachs Co., 117 North Jefferson Street, Chicago, dealer in machine tools.

—

B. M. Houston, foundry engineer of the International Nickel Co., was the principal speaker at the April 25 meeting of the Fort Wayne, Ind., group of the American Society for Steel Treating. His subject was "Extending the Limitations of Cast Iron Through the Use of Nickel and Chromium."

—

Salvador Moreira, research engineer American Steel & Wire Co., was the guest of the Worcester Society of Civil Engineers at their meeting on April 25. Mr. Moreira, a native of Honduras, gave an outline of business and political conditions in Central America.

—

H. J. Griffing, grinding machine engineer Norton Co., Worcester, Mass., on May 2 presented the film, "The Thirtieth Part of a Hair," before the Employers' Association of Eastern Massachusetts.

—

La Roy M. Sherwin has been made foundry superintendent of the Brown & Sharpe Mfg. Co., Providence. He was associated with the Providence concern several years ago, but resigned to take up work in other sections of the country.

—

Charles F. Abbott, executive director American Institute of Steel Construction, Inc., New York, will be the principal speaker at a meeting of the Gray Iron Institute to be held in Philadelphia on May 18 in the convention hall of the Philadelphia Commercial Museum. The meeting will be devoted principally to a discussion of organization problems.

—

Harry H. Leathers, 80 Federal Street, Boston, has been appointed New England agent for the American Fluid Motors Co., Philadelphia, manufacturer of high-pressure hydraulic pumps and hydraulic motors. R. L. Sittinger will be associated with Mr. Leathers in sales work.

—

E. F. Doty, formerly chief engineer of the Buffalo Steam Pump Co., Buffalo, has resigned to organize the E. F. Doty Pump Co., 401 Ellicott Square, Buffalo, which will engage in the manufacture of specialized lines of pumping machinery and handle sales in that territory for the American Well Works, Aurora, Ill.

—

C. P. Potter, engineer in charge of the large motor and transformer divisions of the Wagner Electric Corporation, St. Louis, has been elected chairman St. Louis section, American Institute of Electrical Engineers. He has been a member of the organization since his graduation from the University of Illinois in 1909, having served on various committees and last year as vice-chairman of the section.

—

L. E. L. Thomas, from 1920 until 1927 chief engineer Indiana Harbor, Ind., works, Inland Steel Co., Chicago, has been appointed vice-president Freyn Engineering Co., Chicago, and will devote himself particularly to work in progress for foreign clients. He is a graduate of McGill University, Toronto, and after a varied experience in the iron and steel industry, was made chief draftsman of the Youngstown Sheet &

Tube Co. In 1916 he was made chief engineer of the Gary Tube Co., Gary, Ind., his work having to do with the construction of a plant to include docks, blast furnaces, steel making capacity, rolling mills and tube mills. With the suspension of that work on account of the war he was made chief engineer of the ordnance department, United States Steel Corporation, which was beginning the construction of a munitions plant. When that project was abandoned at the close of the war he returned to the Gary company, where he remained until 1920.

—

Theodore Beran, commercial vice-president General Electric Co., in charge of the New York district, has resigned. He had been manager of the company's New York district since 1903 and vice-president since 1926. He was born at Springfield, Mass., in 1862 and received his college training at the College of the City of New York.

—

Thomas S. Stephens, for the last 25 years associated with the machinery sales activities of Manning, Maxwell & Moore, Inc., New York, most recently as manager of railroad machinery sales, has resigned.

—

H. vanZandt, who has been identified with the Illinois and Carnegie steel company sales departments since 1910, has been appointed assistant general manager of sales for the Illinois Steel Co., in charge of sales of structural shapes, plates, axles and coke oven by-products. He was born at Blawenburg, N. J., in 1882 and attended the Lawrenceville School, Lawrenceville, N. J., and Princeton University, having been graduated from the latter institution in 1905. From 1905 until 1907 he served in the Gautier rolling mill department, Cambria Steel Co., Johnstown, Pa. He then went with the Carnegie Steel Co., where he was employed for a few months in the plate mill department at Homestead before being transferred to the general sales department in May, 1907. He went to the Carnegie Chicago office in February, 1910.

H. VAN ZANDT

—

F. C. Turner, 116 Broad Street, New York, has been appointed export representative for the Beamer Handle Co., Manor, Pa.

—

J. C. Goodnight has joined the Detroit sales organization of the Black & Decker Mfg. Co., Towson, Md., and will specialize in automotive work. He succeeds Henry Fox, who has gone into business for himself. Leon A. Hardy has replaced Jack Caffrey in the company's New York office, Mr. Caffrey having entered another line of business.

—

Stanley W. Parker has been appointed district manager at Chicago for Wheelock, Lovejoy & Co., Inc., Cambridge, Mass., with headquarters in the Pure Oil Building, 31 East Wacker Drive. He was graduated from the Massachusetts Institute of Technology, and after four years in the metallurgical department of the Pennsylvania Steel Co., Steelton, Pa., became associated with Wheelock, Lovejoy & Co. He has been metallurgist and sales engineer in the Cambridge office for 12 years.

—

L. A. Bassett, president Hendrick Mfg. Co., Carbondale, Pa., manufacturer of perforated metal screens, elevator buckets and interlocked steel grating, has returned to his office after an absence of four months in California.

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Thomas G. Nee has been elected president of the Acme Wire Co., New Haven, Conn., following the retirement of Victor M. Tyler. James W. Hook, president Geometric Tool Co., New Haven, has been elected chairman of the executive committee, and Mr. Nee and William G. Redfield have been elected to the board of directors, succeeding James T. Moran and James E. Wheeler. The new president was graduated from the University of Wisconsin in 1900 and from 1905 to 1917 was vice-president and chief engineer of the Mexican Telephone & Telegraph Co. From 1917 until 1927 he was associated with the Allied Machinery Co., New York, a subsidiary of the American International Corporation, having served as president of its Japanese subsidiary, the Horne Co., Ltd.

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William E. Emmett, for the last four years contracting manager in the structural steel department of the Moore Drydock Co., Oakland, Cal., has been appointed field engineer in District No. 10 of the American Institute of Steel Construction, and will have headquarters in the Russ Building, San Francisco. He is a graduate of the University of Kansas and before going with the Moore company was for 11 years identified with the Kansas City Structural Steel Co., Kansas City, Mo.

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Ralph Simpson has been appointed to handle sales in Maine, New Hampshire, Rhode Island and eastern Massachusetts for the Geometric Tool Co., New Haven, Conn. Before joining the Geometric company he was sales manager of the Stockbridge Machine Co., Stockbridge, Mass., and previously was connected with the Potter & Johnson Machine Co., Pawtucket, R. I.

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B. J. Osborne, for six years identified with the structural sales department of the Moore Drydock Co., Oakland, Cal., has been appointed contracting manager of that department, succeeding William E. Emmett.

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J. B. Green, president Fusion Welding Corporation, Chicago, spoke recently on welding at a meeting of managers of railroad, tramway, petroleum and related companies in Mexico City, Mexico. The meeting was arranged by La Consolidada, Mexico City, manufacturer of acetylene welding wire and steel work for welding, and at the invitation of the company, J. J. Sacks, service engineer for the Fusion corporation, has gone to Mexico City, where he will spend several weeks in the interest of Mexican welding developments.

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J. E. Montgomery, vice-president in charge of operations for the Wheeling Steel Corporation, Wheeling, W. Va., has been elected a director to succeed the late Edward Hazlett. Mr. Montgomery has been identified with the corporation for 18 years.

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B. L. Sommer, who has been president Keystone Steel & Wire Co., Peoria, Ill., has been elected chairman of the board, a newly created position. W. H. Sommer, recently vice-president and general superintendent, has been made president, and has been succeeded by D. P. Sommer. Henry G. and R. E. Sommer have been made vice-presidents, the latter in charge of sales.

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John C. Brill, for many years district sales manager at New Orleans for the Inland Steel Co., Chicago, has resigned to become associated in a similar capacity with the Newport Rolling Mill Co., Newport, Ky.

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John F. Braam, Paul Renshaw and Frank W. Moffett were elected vice-presidents and directors of the General Railway Signal Co., Rochester, N. Y., at a recent meeting of the board. Mr. Braam, who is also secretary and assistant treasurer of the company, was identified with the Taylor Signal Co., Buffalo, prior to its merger with the General company in 1904 and has been associated with the latter company since that time. Mr. Renshaw has been assistant to the president, in charge of sales, and will continue in charge of

the sales department. He was formerly with the Federal Signal Co., having come to the Rochester company following the merger of the two organizations in 1924. Mr. Moffett has been assistant to the general manager, in charge of factory operations.

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Graham H. Anthony, for the last 11 years vice-president and secretary of the Allen Mfg. Co., Hartford, Conn., has resigned to become vice-president in charge of manufacturing for Veeder-Root, Inc., recently formed by a consolidation of the Veeder Mfg. Co., Hartford, and the Root Co., Bristol, Conn. Before becoming associated with the Allen company Mr. Anthony was identified with the Gilbert Clock Co., Winsted, Conn.

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A. C. Howell, president American Shovel & Tool Co., Boston, has resigned.

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L. J. Griffiths, assistant general manager of the iron and steel works of the Broken Hill Proprietary Co., Newcastle, N. S. W., and Mr. Young, of the same organization, are now in the United States on a tour of iron and steel production centers. They will sail for Australia about the middle of June.

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J. W. Davis, for the past 10 years attached to the Chicago district office McClintic-Marshall Co., Pittsburgh, has been placed in charge of a St. Louis office, which has just been opened in the Telephone Building, that city.

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Thomas J. Bray, who recently was succeeded as president of the Republic Iron & Steel Co. by Elmer T. McCleary, has been elected a director of the Youngstown Sheet & Tube Co. and will be associated in the operating management of the Sheet & Tube company plant. The board of directors of the Sheet & Tube company was reduced from 14 to 11 members; the others are James A. Campbell, Frank Purnell, A. E. Adams, H. G. Dalton, Harry Coulby, John W. Ford, John Tod, Richard Garlick, C. H. Booth and J. L. Severance.

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R. S. Dutton, manager of sales, Pickands, Brown & Co., Chicago, left April 26 for a two months' vacation in Europe.

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George F. Davie, vice-president and treasurer Interstate Iron & Steel Co., Chicago, has returned from a two months' visit to northern Africa.

## Steel Co. of Canada to Equip for Ore and Coal Unloading from Boats

At the annual meeting of the Steel Co. of Canada, held in Hamilton, Ont., April 25, President Ross H. McMaster in his address to the shareholders said: "In connection with future plant improvements, you will understand that, with the opening of the new Welland Canal, it will be possible to arrange delivery of supplies of ore and coal by means of water transportation. It is proposed to establish on the waterfront at Hamilton, adjacent to the steel plant, a modern unloading and storage dock where the large Lake freighters can dock. This has been anticipated for some years and the new plant will involve a substantial expenditure. The installation, however, should prove a valuable addition in normal times, and will also facilitate plant operations. It is also planned to improve equipment for the generation of steam power as well as to centralize pumping facilities and to increase the consumption and efficiency in the use of waste gases. A point should be reached where consideration should be given to the installation of improved and more modern facilities, looking toward the replacement of certain rolling mill equipment. This will involve corresponding changes in steel producing units and blooming mill. Looking further ahead, blast furnace A will require to be modernized and entirely rebuilt when the market demand for pig iron justifies doing so."

## Vanadium Corporation Personnel Changes

Ward A. Miller, most recently New York sales manager for the Midvale Co., Philadelphia, has been appointed vice-president of the Vanadium Corporation of America, 120 Broadway, New York, and will have general supervision over all commercial affairs of the corporation. He entered the steel business with Joseph T. Ryerson & Son, Inc., Chicago, having also served in the company's New York and Pittsburgh offices. At the beginning of the war he was Pittsburgh district manager for the Ryerson company, but left that position to serve as a captain in the Army Ordnance Corps. At the close of the war he became associated with the Midvale Steel & Ordnance Co., Johnstown, Pa., serving first as manager of the distributers' division of general sales and later as Chicago district sales manager. He has been New York sales manager of the Midvale Co. since the Steel & Ordnance company was absorbed by the Bethlehem Steel Corporation, and in that capacity has been in charge of sales in New York, New England and Canada. He is a member of the American Iron and Steel Institute, the American Electrochemical Society and the American Society for Steel Treating.

WARD A. MILLER

N. Petinot, general manager of sales of the Vanadium corporation, has been appointed assistant to the president, and will devote his time to technical activities in this country and abroad. J. A. Miller, Jr., who has been assistant general manager of sales, succeeds Mr. Petinot, and has been succeeded in turn by Gustav Laub, recently assistant secretary. P. J. Gibbons, assistant treasurer, will assume Mr. Laub's former duties.

Jerome Strauss, material engineer in the United States Naval Gun Factory, Washington, has been engaged by the Vanadium corporation for special engineering and metallurgical work. He was graduated in mechanical engineering from the Stevens Institute of Technology, Hoboken, N. J., in 1913, and entered the steel industry in the metallurgical department of the Illinois Steel Co., South Chicago. He severed this connection to engage in metallurgical work in drop forging manufacture and was thus occupied until the outbreak of the war, when, as a first lieutenant, he was detailed on general inspection work of ordnance materials. Upon leaving the army in 1919 he was made a captain in the Ordnance Reserve. He joined the naval gun factory in that year as assistant chief chemist and metallurgist, later becoming chief chemist and then material engineer. He holds the rank of Lieutenant Commander in the United States Naval Reserve.

## River Shipments of Steel Increase

Inland river movement of iron and steel products continues to make a very favorable showing. According to the report for March of the Pittsburgh office, United States Engineers, iron and steel shipments on the Allegheny River were 725 net tons, compared with 600 tons in March, last year; 77,908 tons on the Monongahela, against 36,112 tons in March, last year, and 77,945 tons on the Ohio River compared with 29,016 tons in March, last year. The total shipments for the first three months of this year compare with those of the same period last year as follows:

| | Allegheny | Monongahela | Ohio |
|---|---|---|---|
| 1928..... | 1,440 | 227,337 | 235,330 |
| 1927..... | 600 | 93,541 | 84,636 |

# *Opposes Anti-Injunction Bill*

(*Continued from page* 1247)

take just as much interest in the figures as does the manager or superintendent.

"Now as to the wage incentive plan for foremen that is in operation in our plant: We have devoted not a little time to the study of the different methods of extra compensation; particularly some means of reducing investment in material, both raw and finished; also, for reducing the amount of work in process. The expense budget was carefully made up and the problem of holding it within a certain amount or lowering it if possible, was one of the chief considerations.

### Savings on Budgeted Expenses Distributed Among Foremen

"In previous years, we had never been able to work to a certain budget; in fact, we had never been given a stipulated amount at which we might aim. After a careful analysis of previous performances, we established a certain amount for actual operating expenses, based on productive labor and shipments. This budget was fixed on the basis of normal operation employing a productive payroll required for shipments. If the actual expense is kept within this figure, a bonus amounting to 10 per cent of basic salary is paid. If the productive payroll required for shipments is reduced or increased, the budget expense is reduced or increased a proportionate amount. In addition to the initial bonus of 10 per cent, one-half of the amount saved on actual expense, under adjusted budget, is distributed pro-rata to the foremen. We feel that this part of our bonus plan has helped wonderfully, and aided in keeping expenses at a minimum; in fact, relatively lower than they had ever been before.

"Another part of the plan affects the investment in materials. A budget was established for the amount of material in process for normal shipments. An increase or decrease in the volume of business will change the budget in proportion to the change in budgeted productive pay. If the amount of work in process is kept within the limits of the budget, a bonus amounting to 10 per cent of basic salary is paid. This part of our plan has helped to reduce the investment in materials in process at least 50 per cent.

"Foremen's bonuses, to obtain the maximum good from them, are not as simple to design as one might imagine. The results desired should be well thought out, and the system designed so that money is paid for what is wanted and not paid so as to encourage what is not desired.

"Naturally when the foremen's wages depend on the volume of business, and average efficiency of the productive and non-productive workers, a spirit of cooperation is immediately built up throughout the entire organization, and better results come quickly.

"Every manufacturer likes to feel that his key men are pulling together intelligently. Some achieve that satisfaction. Foremen know the mechanics of their own jobs, but they have rarely been trained in modern team work and in the principles of modern production methods. That is a matter for your foremen training or conference groups."

### Men Paid According to What They Produce

The Morkrum-Kleinschmidt Corporation, Chicago, has used an incentive system for wage payment for 10 years. In his paper Mr. Heding of that company said the system has proved highly satisfactory to men and management. Under this plan the men are paid according to what they produce. The original system was one of individual bonuses but this later was changed to the group plan, primarily to simplify the clerical work, eliminate checking elapsed time on operations, simplify the time and cost system and reduce the number of job tickets. All operations on a part performed by a group are combined into one group operation—a group in this sense being a number of workers doing the same class of work and pooling their entire output.

The company has found that there is greater cooperation under this method, since everything that will aid in the completion of the work will mean more money for the group and hence for each man, and the individual is willing to help his fellow workers whenever necessary. In a group, one man will set aside his personal feelings because by so doing he is helping to increase his own earnings as well as those of the other men. The older men realize that the sooner they break in the new man the sooner they will get the full advantage of his efforts, while the fact that his fellow workers are so much interested in his success is a spur to the new man to put forth his best efforts.

Under the individual plan of payment, Mr. Heding pointed out, the employees were sometimes inclined to resent the dismissal of a fellow employee for incompetence or laziness, but under the group plan they are glad to see the incompetent or lazy man discharged because they know that he has been holding down the earnings of the group.

### Foremen Participate in Same Proportion as Other Workers

Supervisors, such as general foremen, department foremen and job foremen, also participate in the same proportion as the workers they supervise.

Mr. Heding said that a plant of the type of the Morkrum-Kleinschmidt plant, manufacturing products requiring 20,000 different machine parts made in varying quantities, is usually not considered the ideal shop for any kind of an incentive plan of wage payment; nevertheless, the company believes that an incentive plan built on the proper foundation of time and motion studies, detailed operation instructions carefully planned, machine set-up data, including determined speeds and feeds, teaching workers to perform operations according to methods determined by careful study of experts, and with standard time rates, which include fatigue and other necessary allowances, will reduce costs in any manufacturing plant. While there is a larger plant overhead expense, this is offset many times by the lower unit costs in the manufacturing department.

The company's system is a modified Halsey "50-50" plan. Standard time is determined by adding to the time study allowances for fatigue, power feed machine, hand feed machine, or all hand work, as the case may be. The incentive is based on paying a group of workers working at normal speed a bonus of 20 per cent of their straight hourly rates, provided the group has not wasted any of the time incentive time allowance.

The bonus plan of the company was explained as follows:

### Bonuses Are Paid Every Week

"Bonus periods are of one week in order to fit in with the regular payroll period and also to pay the bonus without unnecessary delay. A group is given credit for all "inspected and passed" work that clears through during the week. The total amount of work finished by a group in one week multiplied by the standard time rates gives the total standard output hours for the week. From the 'in and out' time clock records is obtained the total group actual hours for the week. Total standard, or output hours, divided by the total actual hours gives the efficiency of the group in percentage. From this efficiency figure the bonus percentage is readily obtained and applied to the payroll.

"Standard time rates are subject to change only when there has been a change in methods, tooling, design, machine tool, or in other words, only when there is a change not due to the direct efforts of the workers. Rates in force one year without change are re-time studied in order to make sure that no overlooked change in method of operation had been made.

"Standard time rates are in decimal hours, and while it is not possible for a group to readily figure exactly what their bonus earnings will be, a glance at the standard time rate indicated on the job ticket,

along with a mental shift of the decimal point allows a conversion of the decimal hour rate to one of time per 10, 100 or 1000 units. This allows the operator, also the supervisor, to know the relative speed at which the job is progressing. Maintaining this speed in the group makes possible a close approximation of the bonus earnings.

"Paying bonuses on a pecentage basis from standard time rates eliminates the necessity of changing rates to compensate for fluctuating prevailing wage rates. It also properly takes care of the skilled and semi-skilled workers in a group by paying the skilled worker a larger bonus than is paid the semi-skilled one, due to the difference in regular day rate pay. For example, in a group being paid a 20 per cent bonus, the skilled worker with an hourly rate of 75c. receives 15c. per hr. additional compensation, whereas the lower class worker with an hourly rate of 45c. receives 9c. per hr. additional.

"A general foreman is given the average of the percentages of the departments over which he is supervisor. A general foreman being paid a salary higher than anyone under his supervision consequently receives an additional compensation proportionately greater.

"The foreman of a department split into two or more groups is given a percentage representing the average of the percentages of the groups. A group leader or a foreman of a department small enough to be handled as one group is paid the same bonus percentage as his workers.

"Another advantage of the percentage plan is that, whether computing bonus for workmen or supervisors, it all fits in with the same general scheme and without undue additional clerical expense.

"Quality of work is taken care of by proper inspection. A job not meeting the requirements of the blueprint, gages, or other specification is returned to the department that turned out the job. Time spent in bringing the job to the proper requirements adds to the number of actual hours of working time in the group. This of course tends to lower the efficiency figure with a consequent lowering of additional compensation. Therefore, from supervision down to the lowest worker, there is a constant guarding against doing work improperly.

"In handling the clerical details of our incentive plan, so much of it fits in with the regular clerical routine of timekeeping, payroll, accounting, etc., that very few additional entry forms are necessary.

"An incentive plan to be successful requires from the employer a knowledge of the best methods of performing various operations and duties, and proper instruction and training so that the employee may reach the required proficiency; a continuous study of and search for improved methods; the maintenance of favorable working conditions, and in general, a sincere sympathy with and clear appreciation of the employee's needs and desires."

# Foreman Training by the Blackboard Route

GEORGE SEYLER of the Lunkenheimer Co., Cincinnati, conducted an interesting class in foremanship training at the opening of the Thursday session. He directed 20 of the members and with their aid demonstrated the advantages of the blackboard method of training foremen as against the lecture method. By the blackboard method, he said, the men themselves are more inclined to air their own opinions and grievances, and as they participate actively in the discussions rather than being mere listeners, they are not only more interested, but greater good comes out of such meetings, Mr. Seyler said.

The twenty manufacturers volunteering were asked to put themselves in the position of managers and suggest answers to the following question: What are some of the things that management expects of foremen? The qualifications agreed upon were as follows, in part:

| | |
|---|---|
| Be a leader | A square deal |
| Cooperation | Discipline |
| Low costs and expected quality | Make his own schedule and plan in his work |
| Be an organizer | Expect him to have knowledge of work in his department |
| Loyalty | |

Then reversing the situation, Mr. Seyler asked the members to put themselves in the position of foremen and to suggest answers to this question: What are some of the things foremen expect from management?

Similarly, about twenty such items were finally listed on the board, all to illustrate how a group of foremen can have their thinking quickly directed to the problems at hand. Incidentally the demonstration proved highly amusing as well as informing.

### Industrial Budgeting Recommended by Howard Coonley

Howard Coonley, president Walworth Co., Boston, discussed the industrial budgeting plan in operation in the Walworth business. The most recent phase of this work, which has been conducted for more than 10 years, is forecasting by means of plotted curves. Mr. Coonley said that the forecasting chart is first made up by a theorist, and then discussed at a meeting of all heads of departments, and when finally agreed upon is made the basis for all of the company's activities—manufacturing, sales, purchasing and financing—for the period for which the forecast is made. Account is taken of the state of the inventory and seasonal fluctuations in the company's business, but so far as possible the calculations form the groundwork for the budget made up in advance. Mr. Coonley said that it was necessary from time to time to make adjustments in the budget because of conditions arising that could not be forecast, but in the main the budget comes within 5 per cent or so of actual performance.

Among the results which have followed the budgeting plan Mr. Coonley mentioned these: If demands for the company's products do not require full production throughout the year, an effort is made to have the letdown come in the summer, when men can more easily obtain outside jobs and when their financial obligations are lighter. The company is able to estimate more closely its financial requirements for a year in advance and to avoid the pitfalls of ordering new equipment and not having the money for it when it comes in. The greatest advantage, he said, is that management's eyes are turned forward instead of backward. Also, the budget gives something with which actual performance can be compared, thus determining the factors which may deflect actual results as compared with the results forecast. The budget plan enables a company to estimate its work in advance so that a certain portion of its help can be given employment throughout the year, thereby keeping the indispensable men better satisfied. It also enables the company to frame its expense account in keeping with sales possibilities. A disadvantage, Mr. Coonley said, is the feeling of too much security, especially when a high rate of business activity has been predicted. Mr. Coonley said he now believed it was possible to use the forecast to estimate profits a year in advance, and even the trend of prices can be reliably plotted in advance.

Mr. Coonley predicted that the next great step in industry is to be the scientific study of merchandising. This, he said, has already been done to some extent by such organizations as the General Motors Corporation and the National Cash Register Co., but he believed that progress in this direction will be as great in the coming years as the development of improved manufacturing methods in the past decade.

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Bituminous coal raised in the week ended April 21 is placed at 7,883,000 net tons by the United States Bureau of Mines. This is a sharp increase from the 7,415,000 tons of the preceding week and 7,158,000 tons of the week ended April 7. For the calendar year through April 21 output has been 151,970,000 tons, against 194,003,000 tons for the same period last year.

# European Prices Continue Strong

## German Market Active in Expectation of Higher Prices—Britain's Proposed Tax Reduction May Decrease Steel Costs

(*By Cable*)

LONDON, ENGLAND, April 30.

CLEVELAND pig iron is more active for export and domestic consumers are more interested in buying, but disinclined to place large contracts for forward delivery. Hematite is in better demand, but stocks are still large and one hematite furnace on the East Coast has transferred its production to foundry pig iron. On the West Coast, the North Lonsdale Iron & Steel Co. is starting two hematite furnaces. Foreign ore is firm as a result of the continuance of the Swedish miners' strike.

Finished iron and steel is slightly more active with improved demand from home engineering plants and some rail business recently booked. Export business, however, is quiet and conditions are less favorable in the shipbuilding industry.

Tin plate is very firm and demand continues heavy. Further heavy tonnages have been booked for delivery to the end of the year so that many makers are now full until August and can book but little for delivery before October. On forward contracts 18s. 4¼d. ($4.49) has been paid. Stock and prompt tin plate is scarce at 18s. 6d. ($4.51). Shipments continue on a large scale.

Galvanized sheets are inactive and most works are prepared to accept the official minimum prices. Business has been moderate in the heavier gages of black sheets and Japan is buying some fair tonnages of light gages.

In April, 19 vessels aggregating 28,400 tons were launched on the Clyde, compared with 21 vessels aggregating 33,700 tons in April, 1927.

The Government's budget proposals include 75 per cent reduction of local tax rates on industrial plants and certain remissions in the local rates on railroads, the total of which it is estimated will result in an average reduction of steel costs by 5s. 6d. ($1.34) per ton. Severe criticism has been evoked by a clause that first relief is to be granted only after 18 months.

Arrival here of Charles M. Schwab is awaited with interest in connection with proposals said to have been made for the amalgamation of British iron and steel companies under the auspices of a new finance company of Great Britain and the United States.

Continental material is fairly firm, except pig iron, which is subject to keen British competition. Better steel demand is reported in Germany based on the possible price advance because of the proposed increase in coal miners' wages and railroad freight rates.

## German Buyers Active—Expecting Price Increase

(*By Radio*)

BERLIN, GERMANY, April 30.

DOMESTIC prices for May are unchanged. The market for semi-finished material and rolled products has become suddenly active with a heavy demand for bars and structural shapes. The cause is the expectation of consumers that the proposed advance in Ruhr coal prices as a result of the 8 per cent increase in miners' wages will make steel costs higher.

Employment reports show a decided improvement in the steel, engineering and electrical industries. Foreign orders for heavy iron and steel are coming in satisfactorily and mills are making efforts to increase export trade.

The unfilled tonnage of the United Steel Works, Düsseldorf, is reported at the same level as December, 1927, but the proportion of foreign orders has increased.

## BELGIAN PRICES STEADY

### Still Show Tendency to Advance—Competition of British Iron Is Severe

ANTWERP, BELGIUM, April 11.—Despite the limited volume of business which is attributed partly to the recent Easter holidays, mills are maintaining prices fair-

**British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Durham coke, del'd. | £0 | 17¾s. | | | | $4.33 | |
| Bilbao Rubio ore*.. | 1 | 2½ | | | | 5.48 | |
| Cleveland No. 1 fdy. | 3 | 8½ | | | | 16.56 | |
| Cleveland No. 3 fdy. | 3 | 6 | | | | 16.07 | |
| Cleveland No. 4 fdy. | 3 | 5 | | | | 15.83 | |
| Cleveland No. 4 forge | 3 | 4½ | | | | 15.71 | |
| Cleveland basic (nom.) | 3 | 15 | to | 3 | 15½ | 18.27 | to 18.39 |
| East Coast mixed... | 3 | 9 | to | 3 | 10 | 16.81 | to 17.05 |
| East Coast hematite. | 3 | 10½ | | | | 17.17 | |
| Rails, 60 lb. and up. | 7 | 15 | to | 8 | 0 | 37.75 | to 38.96 |
| Billets | 6 | 0 | to | 6 | 10 | 29.22 | to 31.66 |
| Ferromanganese ... | 13 | 10 | | | | 65.75 | |
| Ferromanganese (export) | 13 | 0 | to | 13 | 5 | 63.31 | to 64.53 |
| Sheet and tin plate bars, Welsh..... | 5 | 7½ | to | 5 | 15 | 26.18 | to 28.01 |
| Tin plate, base box. | 0 | 18⅛ | to | 0 | 18½ | 4.48 | to 4.51 |
| Black sheets, Japanese specifications. | 13 | 5 | | | | 64.53 | |
| | | | | | | C. per Lb. | |
| Ship plates..... | 7 | 12½ | to | 8 | 2½ | 1.66 | to 1.77 |
| Boiler plates..... | 9 | 2½ | to | 9 | 12½ | 1.98 | to 2.09 |
| Tees | 8 | 2½ | to | 8 | 12½ | 1.77 | to 1.99 |
| Channels | 7 | 7½ | to | 7 | 17½ | 1.60 | to 1.71 |
| Beams | 7 | 2½ | to | 7 | 12½ | 1.55 | to 1.66 |
| Round bars, ¾ to 3 in. | 7 | 5 | to | 7 | 15 | 1.58 | to 1.69 |
| Steel hoops | 10 | 10 | to | 11 | 0 | 2.28 | to 2.39 |
| Black sheets, 24 gage | 9 | 15 | to | 9 | 17½ | 2.12 | to 2.14 |
| Galv. sheets, 24 gage | 13 | 0 | to | 13 | 2½ | 2.82 | to 2.85 |
| Cold rolled steel strip, 20 gage, nom. | 14 | 0 | to | 14 | 5 | 3.04 | to 3.10 |

*Ex-ship, Tees, nominal.

### Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Foundry pig iron (a): | | | | | | | |
| Belgium | £3 | 3s. | | | | $15.34 | |
| France | 3 | 3 | | | | 15.34 | |
| Luxemburg | 3 | 3 | | | | 15.34 | |
| Basic pig iron (nom.) | | | | | | | |
| Belgium | 3 | 0 | to | £3 | 1s. | 14.61 | to $14.85 |
| France | 3 | 0 | to | 3 | 1 | 14.61 | to 14.85 |
| Luxemburg | 3 | 0 | to | 3 | 1 | 14.61 | to 14.85 |
| Coke | 0 | 18 | | | | 4.39 | |
| Billets: | | | | | | | |
| Belgium | 4 | 10½ | to | 4 | 11½ | 22.04 | to 22.29 |
| France | 4 | 10½ | to | 4 | 11½ | 22.04 | to 22.29 |
| Merchant bars: | | | | | | C. per Lb. | |
| Belgium | 5 | 6 | to | 5 | 7 | 1.17 | to 1.18 |
| France | 5 | 6 | to | 5 | 7 | 1.17 | to 1.18 |
| Luxemburg | 5 | 6 | to | 5 | 7 | 1.17 | to 1.18 |
| Joists (beams): | | | | | | | |
| Belgium | 4 | 15 | to | 4 | 16 | 1.05 | to 1.06 |
| France | 4 | 15 | to | 4 | 16 | 1.05 | to 1.06 |
| Luxemburg | 4 | 15 | to | 4 | 16 | 1.05 | to 1.06 |
| Angles: | | | | | | | |
| Belgium | 5 | 3½ | | | | 1.14 | |
| ⅛-in. plate: | | | | | | | |
| Belgium (a) | 6 | 9 | to | 6 | 10 | 1.42 | to 1.43 |
| Germany (a) | 6 | 9 | to | 6 | 10 | 1.42 | to 1.43 |
| ⅜-in. ship plate: | | | | | | | |
| Belgium | 6 | 4 | to | 6 | 4½ | 1.32 | to 1.33 |
| Luxemburg | 6 | 4 | to | 6 | 4½ | 1.32 | to 1.33 |
| Sheets, heavy: | | | | | | | |
| Belgium | 6 | 1 | | | | 1.34 | |
| Germany | 6 | 1 | | | | 1.34 | |

(a) Nominal.

ly well. Producers claim to be well booked with orders for the present and are not inclined to offer concessions. The French domestic market has improved considerably, so that French mills are not so active in export business, and this is aiding Belgian mills to maintain an independent position on prices. In a few cases there have been slight increases in prices, but these have not yet been tested by actual transactions. Exporters who have accepted foreign orders and have not yet placed the business with mills are still seeking lower prices, but without success.

**Pig Iron.**—There is a good demand for foundry iron from domestic users, and prices are being maintained at about $16.25 per ton, f.o.b. furnace, for No. 3 phosphoric foundry. British competition in hematite has curtailed export business in this grade, which is quoted at £3 2s. 6d. ($15.40) per ton, f.o.b. Antwerp. As a result of the foreign competition, Bessemer hematite iron is quoted at not more than 650 fr. ($18) per ton, f.o.b. furnace.

**Semi-Finished Material.**—Following a perod of weakness in prices, semi-finished products have recovered and current quotations for export are £4 3s. to £4 9s. ($20.35 to $21.80) per metric ton on blooms, £4 10s. to £4 11s. 6d. ($22.05 to $22.40) per ton on billets and about £4 13s. ($22.80) per ton on sheet bars, all f.o.b. Antwerp.

**Finished Material.**—Mills continue to show a firm attitude in the face of efforts by buyers to secure lower prices. The total of orders, however, is small, but makers are still booked with enough business to carry them for some time. Exporters with orders for foreign delivery that they have not yet placed with mills are beginning to show an inclination to meet the price ideas of producers. Prices on steel bars are firm and show a slight tendency to increase. Considerable business could have been done with British consumers and in Far Eastern markets at £5 3s. per ton (1.14c. per lb.), but makers are offering no concessions and are maintaining prices at £5 5s. to £5 6s. per metric ton (1.16c. to 1.17c. per lb.), f.o.b. Antwerp. Prices on beams are stronger at £4 15s. per ton (1.05c. per lb.), but the hoop market still shows some weakness in prices, as production is rather heavy and demand decidedly small. Hoops are quoted at about £6 per ton (1.33c. per lb.), f.o.b. Antwerp. Corrugated bars have been sold at £5 10s. per ton (1.22c. per lb.).

## AUSTRALIAN STEEL MERGER

### Open-Hearth, Blast Furnaces, Electric Rolling Mills and Centrifugal Pipe Plant Projected

WASHINGTON, May 1.—Recent organization of the Australian Iron & Steel Co., Ltd., capitalized at £5,000,000, is spoken of in Australia as the largest undertaking of the kind in the history of that country, according to a report received by the Department of Commerce from the vice-consul at Sydney. The companies concerned in the merger are Dorman, Long & Co., Ltd., and Baldwin's, Ltd., both of England, Howard Smith, Ltd., Melbourne, and the Hoskins Iron & Steel Co., Ltd. The latter firm has for some years been engaged in manufacture at Brisbane, Queensland, and Sydney and Lithgow, New South Wales. Recently interests were acquired at Port Kembla, New South Wales, which will be the headquarters of the new organization. The products of the new company include a general line of iron and steel.

The Commonwealth Minister for Customs is quoted by an Australian paper as saying that a new blast furnace at Port Kembla will be completed in June and that it is intended to proceed immediately with the erection of steel furnaces, electric power plants, engineering shops and rolling mills. Electrically driven rolling mills will make the new plant one of the most modern in the British Empire. In addition, the minister is quoted as saying that a plant will be established for the manufacture of centrifugal cast iron pipe by the De Lavaud process. The minister, according to press reports, said that the organization of the iron and steel companies into one unit was a direct result of his recent visit to London and of favorable tariff legislation giving additional protection to the iron and steel industry of Australia. The legislation has passed the Australian House of Representatives and now is before the Senate.

The directors of the new company will be Cecil H. Hoskins, chairman of the board Hoskins Iron & Steel Co., chairman; Sir Arthur Dorman, chairman of the board Dorman, Long & Co.; Sir W. Charles Wright, chairman of the board Baldwin's, Ltd.; H. B. Howard Smith, chairman of the board Howard Smith, Ltd.; Arnold S. Taylor, chairman of the board Southern Portland Cement, Ltd., and Lawrence Ennis, A. Sidney Hoskins and Edwin H. Flack, directors of various companies included in the merger.

## FRENCH EXPORT PRICES FIRMER

### Foreign Bar Orders Go to German Mills—Output Increases—British Pig Iron Competitive

PARIS, FRANCE, April 20.—The domestic market continues firm, and export prices, which had developed some weakness prior to the Easter holidays, are stronger. On the whole, the price situation is satisfactory, but a steady increase in output may result in surplus tonnage in the near future. Among consumers of steel and with a few finishing mills business is slack and full operation has not been possible. This seems to be generally considered as a temporary condition brought about by the elections. Shares of iron and steel companies quoted in the stock market have shown considerable advances in price during the past few weeks, in some cases rising as much as 36 per cent.

**Pig Iron.**—In the export field, British competition is keen. Foundry iron is quoted at £3 2s. to £3 2s. 6d. ($15.10 to $15.22) per ton, f.o.b. Antwerp. Basic ranges from £2 15s. to £2 16s. ($13.40 to $13.64) per ton. It is reported that concessions from the prices set by the French-Belgian-Luxemburg pig iron entente are being offered by sellers on the seaboard, where British competition is particularly severe. The inland market is satisfactory, with foundry consumers buying freely. A total of 38,000 tons of foundry iron has been set aside for shipment to domestic users in May. This is the same as the April tonnage. At the same time prices have been reduced by 5 fr. (20c.) per ton for inland delivery except in the North, where prices have been advanced 5 fr. (20c.) per ton. However, prices in the North were recently reduced by about 15 fr. (59c.) per ton, so that the new revision leaves a difference of only 5 fr. per ton in domestic quotations. The tonnage of hematite iron set aside for May is 41,000 tons, compared with 35,000 tons in April. Prices have been advanced 2.50 fr. to 5 fr. (10c. to 20c.) per ton on domestic business.

**Semi-Finished Material.**—Export demand is light, but prices are slightly firmer. Blooms are quoted at £4 to £4 2s. 6d. ($19.48 to $20.09) per ton for the large and medium sizes. Small blooms, 4 to 5 in., are in good demand and have been sold at as high as £4 9s. to £4 10s. ($21.68 to $21.92) per ton, f.o.b. Antwerp. Billets range from £4 9s. to £4 11s. 6d. ($21.68 to $22.29) per ton. Sheet bars are £4 11s. to £4 12s. 6d. ($22.16 to $22.53) per ton.

**Finished Material.**—Sizable tonnages of bars were offered to exporters for shipment to the United Kingdom and Japan at £5 3s. per ton (1.14c. per lb.), but with the market growing firmer, exporting houses were not inclined to risk being unable to place the business with mills. Current prices range from £5 4s. 6d. to £5 5s. per ton (1.15c. to 1.16c. per lb.), f.o.b. Antwerp. German mills have sold some important bar tonnages to Holland, the total being reported at about 25,000 tons. The price is understood to have been £5 5s. per ton (1.16c. per lb.), delivered. Beam prices are firmer, with normal specifications at £4 13s. to £4 13s. 6d. per ton (1.02c. to 1.03c. per lb.), f.o.b. Antwerp. Wire rod prices have been fixed by the syndicate at £5 15s. per ton (1.27c. per lb.) for 5 to 5.5 mm. £5 17s. 6d. per ton (1.30c. per lb.) for 6 to 8 mm. and £6 per ton (1.32c. per lb.) for 8.5 to 13 mm. Export sheet prices are firm, with 0.5 mm. black sheets at £10 5s. to £10 10s. per ton (2.26c. to 2.32c. per lb.).

**Rails.**—The European Rail Makers' Association has agreed to maintain the price of £6 7s. 6d. ($31.05) per

ton, f.o.b. shipping port, as the price for second quarter. The extra for open-hearth rails has been increased from 5s. ($1.22) to 7s. 6d. ($1.83) per ton. There has been a considerable increase in the tonnage of rails and steel ties used by the French railroads. For example, the Compagnie du Chemin de Fer de Paris à Orleans used 1,271,000 steel ties in 1927, compared with 700,000 in the year prior to the war, and 63,400 tons of new rails, compared with 10,000 tons in 1914.

## STEEL IMPORTERS MORE ACTIVE

### Bidding on Concrete Bars for Mexico—Japanese to Build Galvanizing Plants in India

NEW YORK, April 30.—Importers of European steel report slightly greater activity, but prices are still higher than some time ago, and not much tonnage has been placed by consumers in the United States. There is considerable interest in hoops and bands, however, and business in these products is fairly steady. A number of inquiries for reinforcing bars are outstanding, but they are not regarded as promising prospects by sellers of the foreign product except in the case of about 2500 to 3000 tons of reinforcing bars wanted by the Ambursen Construction Co., Grand Central Terminal, New York, which has a contract in Mexico.

Export business with the Far East is only moderately active. Most of the current buying of light-gage black sheets by Japanese consumers is being done in Great Britain at less than the American market price. The Kioto Oil Co. in Japan, which inquired for about 15,000 base boxes of tin plate, has closed on about 10,000 boxes. These were divided between two large Japanese export houses, which awarded the business to four different American mills.

Tokio municipality has placed 6 miles of 91-lb. high T-rails and is in the market for 2 miles of 100-lb. girder rails and 1 mile of 94-lb. grooved rails, bids on which will open April 29. Nagoya municipality has placed about 430 tons of 91-lb. high T-rails with a Japanese export house for execution by "Columeta" in Belgium.

Recent Japanese purchases of wire rods have been rather large, being estimated by some sellers at close to 6000 tons, of which about half went to the leading American interest and half to the leading Canadian maker. The American prices on this business are understood to have been about $36 per ton, c.i.f. Japan, on the low-carbon rods (0.06 to 0.12 per cent carbon) and about $43 per ton, c.i.f., on the high-carbon rods (0.55 to 0.65 per cent carbon). The Canadian quotations were in most cases about 25c. to 50c. per ton less, but later the Canadian seller withdrew from the market.

The market on wood screws in Japan is reported to be rather unsettled, and an increasing quantity of European screws is replacing the American product. With about 15 brands of American and European screws being offered, competition is keen. Among the American brands bought in Japan are "Amesco," "Reed & Prince," "Marui," "Olbin" and "Bridgeport." European brands in the Japanese market are "A.B.C.," "Arrow Brand," "Stemman," "Woodholm" and "Austria."

Under normal conditions Japanese galvanizing plants export a sizable tonnage of sheets to India. Recently, sheet interests in Japan have been investigating the possibility of establishing galvanzing plants in India, which would be operated with Indian labor at lower costs than in Japan.

## German Exports of Aircraft Increasing Rapidly

HAMBURG, GERMANY, April 15.—Exports of aircraft are increasing rapidly, although the total number of machines shipped is still small. In 1925 only 11 airplanes were exported from Germany; in 1926 a total of 24 was shipped, and in 1927 the total was 54. In the first quarter of this year 28 airplanes were exported, so that it is expected that shipments for this year will be considerably in excess of any other year. The figures do not include the machines shipped on reparations account to Italy, Jugoslavia, France, Belgium and other countries, and no account is taken of the airplanes built for the Deutsche Lufthansa in its air service with Russia, Scandinavian countries, Switzerland, Spain, France, Turkey, Persia and the Near East. Of the exports last year, Colombia received six, Japan three, Argentina four and Brazil four machines. All exports were of large air service machines for six to 18 passengers each.

## Rails of Electric Furnace Steel Used in Austria

HAMBURG, GERMANY, April 15.—A new type of rail, brought out by the Alpin Montangesellschaft in Austria and now being used by the Austrian railroads, is rolled from electric furnace steel of high manganese and silicon content. While the new rails are higher in price than the open-hearth product, tests by the Austrian railroads are said to have shown that they have better wearing quality and in the mountainous districts have about double the life of ordinary rails.

## Qualifications for Welders

(*Concluded from page* 1244)

several welded pressure vessels which are to be studied and tested to destruction at the Bureau of Standards. These tests will supplement those made on smaller tanks, 24 in. in diameter, several years ago, and it is hoped that the results will be convincing enough so the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers may be amended to allow a more liberal use of this new method of construction.

Another committee on structural steel welding, of which J. H. Edwards, American Brdge Co., is chairman, has under way an extensive series of tests to determine safe working stresses of various types of joints in structural steel. An exploratory series has already been tested, and has given much information on the types of joints which should be more intensively studied. This program is so large and requires so many cooperating firms that the committee has drawn up detailed specifications covering methods of testing welders, equipment, welding technique, details of test bars, inspection and tests. This represents the best procedure control for structural welding, either arc-welding or ox-welding, known in the present state of the art, and on publication should be available for a control in many welding shops where important work is being done.

#### Officers for 1928

New officers elected Thursday, April 26, are as follows:

President: Fred T. Llewellyn, United States Steel Corporation, New York.

Senior vice-president: A. E. Gaynor, John A. Roebling's Sons Co., New York.

Vice-president, Western division: Ernest Lunn, Pullman Car & Mfg. Corporation, Chicago.

Vice-president, Eastern division: W. J. Meadowcroft, Edward G. Budd Mfg. Co., Philadelphia.

Vice-president, New England: H. P. Peabody, John A. Roebling's Sons Co., Boston.

Treasurer: C. A. McCune, American Chain Co., Bridgeport, Conn.

Secretary: Miss M. M. Kelly, New York.

The retiring president, F. M. Farmer, Electrical Testing Laboratories, New York, becomes a member of the board of directors, together with the following new members: A. M. Candy, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; J. H. Deppeler, Metal & Thermit Corporation, Jersey City, N. J.; E. H. Ewertz, consulting engineer, New York, and S. W. Miller, Union Carbide & Carbon Research Laboratory, Long Island City, N. Y.

# Large Increase in Steel Exports

## Tonnage Greatest in Four Years—Imports Much Larger Than in February, with Pig Iron Showing Considerable Gain

WASHINGTON, April 26.—With exports of iron and steel products from the United States in March aggregating 221,935 gross tons, a gain of 36,020 tons or 19.4 per cent over February, as stated in THE IRON AGE of April 26, the total for the three-month period ended with March amounted to 613,616 tons, or an increase of 60,165 tons over the corresponding period of last year. The March outgoing tonnage was the greatest for any month since January, 1924.

By some this added export movement is attributed to an important degree to the reduction of 20 per cent in the freight rate on iron and steel products which became effective on Jan. 1. The tariffs reducing the rate were filed with this purpose in view and the railroads announced that they were "experimental," intimating that, should the gain in iron and steel exports be substantial, they would be made permanent. The showing so far made lends encouragement to the hope of exporters that the railroads will take such action.

Exports in March, representing an increase of 50,067 tons over the corresponding month of last year, reflected a gain in all but four products—ferromanganese, scrap, wire rope and carwheels and axles—when compared with February. There was an increase in every category of rolled products. For the first quarter there was a gain in the exportation of all but nine products, when compared with the corresponding period of last year. The nine items registering decreases were iron bars, steel bars, galvanized sheets, black steel sheets, black iron sheets, hoops and bands, tin plate, steel rails and boiler tubes and welded pipe.

Imports in March, amounting to 74,128 tons, a gain of 26,500 tons or 55.6 per cent when compared with February, showed increases in most of the important lines, particularly in pig iron, ferromanganese, semi-finished steel, steel bars, hoops and bands, structural shapes and pipe, both cast iron and seamless. For the three months ended with March, however, imports showed an increase of only 5712 tons when compared with the corresponding period of last year, rising to 180,391 tons from 174,679 tons.

Scrap was the largest item of exportation in March, with a total of 26,510 tons, of which 14,058 tons went to Canada, 5895 tons to Japan and 5252 tons to Poland and Danzig. Next came boiler tubes and welded pipe, with a total of 24,068 tons. Black welded pipe exports were 6443 tons, of which 1342 tons went to Venezuela, 965 tons to Mexico, 663 tons to the United Kingdom, 580 tons to Japan and 570 tons to Canada. Casing and oil line pipe exports totaled 11,775 tons, of which 3070 tons went to Colombia, 2534 tons to Venezuela, 2484 tons to Peru and 1072 tons to Argentina. Exports of galvanized pipe amounted to 3191 tons, and were widely scattered in comparatively small lots. Cuba took 433 tons, Brazil 347 tons, and Mexico 345 tons. Of the 22,755 tons of tin plate exported during the month, 4439 tons went to Canada and 2769 tons to Japan.

Steel rail exports for the month were 15,798 tons, Brazil leading as the principal country of consumption,

**Imports of Iron and Steel into the United States**

(In Gross Tons)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| Pig iron | 16,155 | 7,492 | 33,669 | 21,235 |
| Ferromanganese* | 4,666 | 3,339 | 10,875 | 6,596 |
| Ferrosilicon | 147 | 1,272 | 845 | 3,141 |
| Ferrochrome | 50 | .... | 188 | 359 |
| Scrap | 2,522 | 5,074 | 9,215 | 15,680 |
| *Pig iron, ferroalloys and scrap* | *23,540* | *17,177* | *54,792* | *47,011* |
| Steel ingots, blooms, billets and slabs | 2,112 | 1,551 | 4,465 | 4,035 |
| Iron blooms, slabs, etc. | 3 | .... | 4 | .... |
| Wire rods | 2,135 | 1,466 | 5,399 | 3,907 |
| *Semi-finished steel* | *4,250* | *3,017* | *9,868* | *7,942* |
| Rails and splice bars | 940 | 1,031 | 4,271 | 4,885 |
| Structural shapes | 17,131 | 15,079 | 41,661 | 36,736 |
| Boiler and other plates | 308 | 166 | 380 | 840 |
| Sheets and saw plates | 2,708 | 632 | 8,490 | 3,378 |
| Steel bars | 9,991 | 10,999 | 26,677 | 22,987 |
| Bar iron | 27 | 441 | 460 | 1,306 |
| Hoops, bands and cotton ties | 2,949 | 1,317 | 6,352 | 7,047 |
| Tubular products (wrought) | 3,504 | 3,336 | 7,946 | 11,543 |
| Nails, tacks, staples | 709 | 209 | 1,646 | 1,256 |
| Tin plate | 24 | 20 | 69 | 62 |
| Bolts, nuts, rivets and washers | 9 | 14 | 65 | 73 |
| Round iron and steel wire | 386 | 233 | 961 | 823 |
| Barbed wire | 400 | 584 | 986 | 1,882 |
| Flat wire; strip steel | 240 | 252 | 588 | 661 |
| Steel telegraph and telephone wire | .... | .... | 46 | 24 |
| Wire rope and strand | 138 | 245 | 406 | 564 |
| Other wire | 94 | 66 | 188 | 105 |
| *Rolled and finished steel* | *39,558* | *34,624* | *101,192* | *94,172* |
| Cast iron pipe | 6,280 | 6,759 | 13,276 | 24,669 |
| Castings and forgings | 500 | 247 | 1,263 | 885 |
| Total | 74,128 | 61,824 | 180,391 | 174,679 |
| Manganese ore* | 12,786 | 22,917 | 40,377 | 95,107 |
| Iron ore | 162,654 | 197,455 | 643,410 | 685,839 |
| Magnesite | 9,425 | 8,220 | 12,415 | 15,136 |

*Manganese content only.
†Silicon content only.
‡Chromium content only.

**Exports of Iron and Steel from the United States**

(In Gross Tons)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| Pig iron | 4,356 | 3,647 | 12,253 | 9,808 |
| Ferromanganese | 69 | 13 | 2,139 | 107 |
| Scrap | 26,510 | 15,416 | 85,504 | 27,300 |
| *Pig iron, ferroalloys and scrap* | *30,935* | *19,076* | *99,896* | *37,215* |
| Ingots, blooms, billets, sheet bar, skelp | 11,710 | 6,332 | 25,252 | 12,096 |
| Wire rods | 2,134 | 1,450 | 7,449 | 5,152 |
| *Semi-finished steel* | *13,844* | *7,782* | *32,701* | *17,248* |
| Steel bars | 12,005 | 9,115 | 30,566 | 31,504 |
| Alloy steel bars | 1,258 | 533 | 2,796 | 1,395 |
| Iron bars | 222 | 581 | 792 | 1,367 |
| Plates, iron and steel | 12,787 | 10,027 | 33,991 | 29,347 |
| Sheets, galvanized | 15,531 | 13,428 | 37,947 | 44,362 |
| Sheets, black steel | 13,292 | 15,433 | 44,135 | 48,647 |
| Sheets, black iron | 1,151 | 732 | 3,256 | 4,752 |
| Hoops, bands, strip steel | 5,329 | 5,402 | 12,434 | 13,552 |
| Tin plate; terne plate | 22,755 | 26,817 | 60,552 | 97,468 |
| Structural shapes, plain material | 15,148 | 8,976 | 38,366 | 25,146 |
| Structural material, fabricated | 5,915 | 6,205 | 16,729 | 15,929 |
| Steel rails | 15,798 | 13,701 | 54,403 | 55,844 |
| Rail fastenings, switches, frogs, etc. | 6,271 | 1,856 | 19,153 | 7,223 |
| Boiler tubes, welded pipe and fittings | 24,068 | 16,489 | 61,701 | 80,324 |
| Plain wire | 5,072 | 2,663 | 12,070 | 7,175 |
| Barbed wire and woven wire fencing | 7,076 | 3,463 | 17,031 | 7,871 |
| Wire cloth and screening | 178 | 201 | 474 | 583 |
| Wire rope | 442 | 290 | 1,479 | 1,103 |
| Wire nails | 1,175 | 571 | 3,687 | 1,745 |
| Other nails and tacks | 928 | 592 | 2,356 | 1,906 |
| Horseshoes | 38 | 19 | 112 | 71 |
| Bolts, nuts, rivets and washers, except track | 1,119 | 848 | 2,930 | 2,696 |
| *Rolled and finished steel* | *167,558* | *137,942* | *456,960* | *480,010* |
| Cast iron pipe and fittings | 3,942 | 1,649 | 9,209 | 6,734 |
| Car wheels and axles | 1,212 | 1,071 | 3,560 | 2,867 |
| Iron castings | 1,393 | 1,606 | 3,664 | 3,389 |
| Steel castings | 914 | 729 | 2,514 | 1,410 |
| Forgings | 612 | 585 | 1,479 | 1,264 |
| *Castings and forgings* | *8,073* | *5,640* | *20,426* | *15,664* |
| All other | 1,525 | 1,428 | 3,633 | 3,314 |
| Total | 221,935 | 171,868 | 613,616 | 553,451 |

taking 2514 tons, while Chile took 2409 tons. Canada and Japan, which have been declining as markets for rails and a number of other steel products, took but 699 tons and 1462 tons respectively. Canada took 11,682 tons of the 15,148 tons of plain structural steel exported in March and 10,784 tons of the 12,787 tons of plates exported during that month. Japan took 4978 tons and Canada 6533 tons of the 13,292 tons of black steel sheets exported in March. Of the 3114 tons of hoops and bands exported, Canada took 2676 tons, and of the 2215 tons of cold-rolled strip steel, Canada took 2064 tons.

**United States Imports of Iron and Steel Products in March**

(In Gross Tons)

| | | | |
|---|---|---|---|
| Austria | 44 | United Kingdom | 13,801 |
| Belgium | 22,110 | | |
| Czechoslovakia | 676 | *Total Europe* | 66,785 |
| Denmark | 70 | Canada | 3,970 |
| France | 13,488 | Mexico | 31 |
| Germany | 10,356 | British India | 3,338 |
| Italy | 63 | China | 1 |
| Netherlands | 2,323 | Japan | 3 |
| Norway | 1,597 | | |
| Sweden | 2,257 | Total | 74,128 |

Total iron and steel exports to Canada in March were 93,537 tons, and for the three months that country took 230,328 tons, or 37.5 per cent of the total of 613,616 tons.

While the import movement of pig iron in March, amounting to 16,155 tons, was not large, it reflected a sharp gain over February's total of 6387 tons. In March 10,748 tons came from the United Kingdom. This has led to speculation as to whether or not that country, which is recouping its foreign markets, is not again likely to be the principal source of pig iron imports, as was the case several years ago. The United Kingdom also was the leading foreign source of supply of ferromanganese in March, furnishing 1971 tons of the 4666 tons imported. Norway sent 1573 tons and Canada 1056 tons.

Belgium was the source of 6825 tons of the 9991 tons of steel bars imported, while 1438 tons came from France and 938 tons from Sweden. Of the 2949 tons of hoops and bands imported, 1707 tons came from Germany and 239 tons from France. There was an unusually large import movement in March of sheets, skelp and saw plate, largely made up of the first and third items, the total being 2708 tons, of which 2067 tons came from Germany. Of the 17,131 tons of shapes imported, Belgium supplied 9002 tons; France, 6146 tons; Germany, 1659 tons.

France furnished 4859 tons of the 6280 tons of cast iron pipe imported, and 1320 tons came from Belgium. "Other pipe" imports were 3504 tons, of which Germany supplied 1968 tons; Czechoslovakia, 561 tons; France, 252 tons; United Kingdom, 202 tons; Canada, 1927 tons; Belgium, 142 tons. Of the 12,786 tons of manganese ore concentrates imported, 10,187 tons came from Brazil and 2584 tons from India.

Belgium was the principal source of the total imports in March, supplying 22,110 tons. The United Kingdom led France by a small margin as the second largest source, supplying 13,801 tons, against 13,488 tons for France.

## Pig Iron Imports Increase Heavily

Imports of pig iron in March are reported by the Department of Commerce at 16,155 gross tons. This is more than double the 6387 tons of February and more than double the 7492 tons of March, 1927. Two-thirds of the total imports in March came from the United Kingdom. India and the Netherlands made up the bulk of the remaining tonnage.

For the first quarter the incoming quantity was 33,669 tons. This compares with 21,235 tons a year ago. There have been sharp drops in the tonnage received from Germany and from the Netherlands; that from Germany declined more than 99 per cent, while that from the Netherlands was reduced about one-third. These reductions have been more than compensated for by heavy increases in imports from British India and from the United Kingdom. In the latter case the tonnage was multiplied by more than 11, while India supplied almost three times as much in the recent quarter as a year earlier.

**United States Imports of Pig Iron by Countries of Shipment**

(In Gross Tons)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| United Kingdom | 10,748 | 1,250 | 14,548 | 1,250 |
| British India | 3,338 | 2,763 | 12,766 | 4,574 |
| Germany | ..... | 690 | 40 | 6,596 |
| Netherlands | 1,929 | 2,585 | 5,529 | 8,230 |
| Canada | 59 | 56 | 324 | 304 |
| France | ..... | ..... | ..... | ..... |
| Belgium | ..... | 100 | 197 | 100 |
| Norway | ..... | ..... | ..... | ..... |
| All others | 81 | 48 | 265 | 181 |
| Total | 16,155 | 7,492 | 33,669 | 21,235 |

## Increased Production of Malleable Castings

Malleable castings produced in March are reported by the Depatment of Commerce at 63,322 tons. The returns are from 133 plants. The current figure compares with 59,045 tons in February and with 66,372 tons a year ago. With the exception of March, 1927, the total in March was the largest in two years.

Shipments in March were almost exactly the same as production, this being in striking contrast with the five preceding months, in each of which production was much heavier than shipments. Orders booked during the month are reported at 60,697 tons, or about one month's production at current rates. Production is reported to have been at 69.6 per cent of the rated capacity of 91,043 tons.

## Sharp Decline in Imports of Foreign Iron Ore

Imports of iron ore in March are reported by the Department of Commerce at 162,654 gross tons. This is a sharp reduction from the 229,578 tons imported in February and the 251,178 tons in January. It compares with 197,455 tons in March of last year and, except for December, is the lowest amount in many months.

For the first quarter of the year imports were 643,410 tons, compared with 623,163 tons in the first quarter of 1927. More than half of the total in each case came from Chile.

SOURCES OF AMERICAN IMPORTS OF IRON ORE

(In Gross Tons)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| Canada | 217 | 540 | 38,845 | 1,366 |
| Cuba | 47,200 | 33,000 | 94,700 | 129,000 |
| Chile | 90,800 | 91,000 | 362,900 | 323,200 |
| Spain | 250 | 3,723 | 5,250 | 3,723 |
| Sweden | 6,383 | 14,143 | 6,383 | 44,124 |
| French Africa | 9,693 | 54,090 | 102,024 | 110,840 |
| Other countries | 8,111 | 959 | 33,308 | 10,910 |
| Total | 162,654 | 197,455 | 643,410 | 623,163 |

Exports of agricultural implements from the United States in March were valued at $9,318,916, or approximately $575,000 more than the exports in March of last year, according to the agricultural implements division, Department of Commerce, Washington. Exports for the first quarter of the present year showed an increase of $6,347,784 over the corresponding period of last year.

The United States has 1075 airport landing fields, according to a list just published by the Aeronautics Branch, Department of Commerce. There are also nearly 4000 others on which planes may land. California, with 115 air fields, leads. Texas is second with 90, and Pennsylvania third with 68.

# Heavy Increase in Machine Exports

## Largest Value in Seven Years Sent Abroad in March— Imports Higher Than in February

WASHINGTON, April 26.—Making a gain of $6,417,287, exports of machinery of all kinds in March were valued at $42,372,463, against $35,955,176 in February. The movement in March of last year was valued at $38,937,144. For the three months ended with March machinery exports were valued at $114,577,472, compared with $101,968,651 for the first quarter of 1927.

Exports of industrial machinery in March were valued at $19,026,074, according to the classification of the division of statistics, Department of Commerce. This compares with $16,202,582 in February and with $17,729,364 in March of last year. For the three months ended with March the value was $51,489,241, against $49,045,974 for the corresponding period of last year. Power-driven metal-working machinery to the value of $1,960,407 was exported in March, against $1,242,234 in February and $1,325,639 in March of last year. For the first quarter the value was $5,990,096, compared with $3,941,022 for the corresponding period of last year. Exports of power-driven metal-working machinery as listed in THE IRON AGE table represented 740 items in March, valued at $1,103,000, against 686, valued at $1,315,771, in January, and 623, valued at $1,242,234, in February.

Total imports of machinery and vehicles in March were valued at $2,433,564, against $2,668,715 in March of last year. For the first quarter they were valued at $6,550,659, against $6,981,256 for the first three months of 1927. Items listed in THE IRON AGE table of imports of machinery were valued in March at $1,819,672, against $1,714,648 in February and $2,084,261 in March of last year. For the three months of the current year the value was $4,718,486, compared with $4,435,879 for the corresponding period of last year. Imports of industrial, office and printing machinery in March were valued at $1,404,786, against $1,324,521 in February and $1,208,009 in March of last year.

## National Machine Tool Exposition to Be Repeated in 1929

The committee on expositions of the National Machine Tool Builders' Association has announced that it is unanimously in favor of holding another national machine tool exposition in 1929. A vote by mail by members of the association disclosed that 52.6 per cent were in favor of another exposition next year, while the remainder of those voting wanted to wait until 1930. Answers to a questionnaire submitted to the members disclosed that a majority was of the opinion that expositions constitute a sound method of merchandising machine tools, an opinion that was fortified by the results of the exposition held in Cleveland last year.

### Machinery Exports from the United States

(By Value, in Thousands of Dollars)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| Locomotives | $427 | $2,256 | $633 | $3,452 |
| Other steam engines | 62 | 76 | 161 | 414 |
| Boilers | 112 | 117 | 261 | 534 |
| Accessories and parts | 85 | 123 | 168 | 516 |
| Automobile engines | 1,781 | 1,358 | 3,478 | 3,142 |
| Other internal combustion engines | 606 | 1,013 | 1,705 | 2,824 |
| Accessories and parts | 353 | 418 | 818 | 1,116 |
| Electric locomotives | 22 | 58 | 510 | 126 |
| Excavating machinery | 771 | 449 | 1,964 | 1,080 |
| Concrete mixers | 103 | 114 | 230 | 308 |
| Road-making machinery | 80 | 179 | 230 | 370 |
| Elevators and elevator machinery | 341 | 444 | 972 | 1,204 |
| Mining and quarrying machinery | 1,162 | 1,181 | 2,128 | 3,386 |
| Oil-well machinery | 1,513 | 1,280 | 3,377 | 4,692 |
| Pumps | 871 | 470 | 1,907 | 1,506 |
| Sheet and plate metal-working machines | 178 | 102 | 400 | 258 |
| Forging machinery | 227 | 68 | 212 | 225 |
| Machine tools* | 1,185 | 823 | 4,087 | 2,382 |
| Other metal-working machinery and parts | 516 | 421 | 1,397 | 1,058 |
| Textile machinery | 1,233 | 816 | 3,371 | 2,563 |
| Sewing machines | 802 | 834 | 2,189 | 2,332 |
| Shoe machinery | 179 | 148 | 481 | 321 |
| Flour-mill and gristmill machinery | 35 | 27 | 126 | 96 |
| Sugar-mill machinery | 157 | 179 | 1,452 | 628 |
| Paper and pulp-mill machinery | 263 | 298 | 951 | 1,458 |
| Sawmill machinery | 13 | 47 | 53 | 185 |
| Other woodworking machinery | 115 | 137 | 432 | 331 |
| Refrigerating and ice-making machinery | 675 | 579 | 1,839 | 1,620 |
| Air compressors | 633 | 483 | 1,494 | 1,207 |
| Typewriters | 1,958 | 1,868 | 5,691 | 5,108 |
| Power laundry machinery | 119 | 170 | 252 | 427 |
| Typesetting machines | 338 | 384 | 1,108 | 912 |
| Printing machinery | 1,523 | 1,274 | 3,907 | 3,458 |
| Agricultural machinery and implements | 9,319 | 8,744 | 25,189 | 18,862 |
| All other machinery and parts | 14,616 | 11,998 | 41,407 | 33,866 |
| Total | $42,372 | $38,937 | $114,577 | $101,969 |

*Principal details in another table.

### Exports of Power-Driven Metal-Working Machinery

| | March, 1928 | | January, 1928 | |
|---|---|---|---|---|
| | No. | Value | No. | Value |
| Engine lathes | 95 | $143,373 | 66 | $157,399 |
| Turret lathes | 29 | 93,995 | 26 | 82,136 |
| Other lathes | 33 | 34,295 | 57 | 155,744 |
| Vertical boring mills and chucking machines | 12 | 23,125 | 7 | 30,978 |
| Thread-cutting and automatic screw machines | 90 | 124,902 | 74 | 88,723 |
| Knee and column type milling machines | 33 | 97,243 | 30 | 69,761 |
| Other milling machines | 47 | 115,442 | 81 | 147,290 |
| Gear-cutting machines | 26 | 59,044 | 31 | 91,452 |
| Vertical drilling machines | 75 | 23,423 | 42 | 44,430 |
| Radial drilling machines | 16 | 53,337 | 18 | 31,519 |
| Other drilling machines | 80 | 14,715 | 42 | 76,167 |
| Planers and shapers | 37 | 64,787 | 40 | 62,459 |
| External cylindrical grinding machines | 81 | 159,396 | 77 | 166,151 |
| Internal grinding machines | 38 | 69,356 | 46 | 76,359 |
| Metal-working tool-sharpening machines | 48 | 26,567 | 49 | 35,203 |
| Total | 740 | $1,103,000 | 686 | $1,315,771 |

### Imports of Machinery into the United States

(By Value)

| | March | | Three Months Ended March | |
|---|---|---|---|---|
| | 1928 | 1927 | 1928 | 1927 |
| Metal-working machine tools | $51,918 | $79,104 | $140,085 | $126,730 |
| Agricultural machinery and implements | 526,986 | 958,348 | 1,473,701 | 1,285,303 |
| Electrical machinery and apparatus | 243,102 | 303,706 | 527,844 | 506,067 |
| Other power-generating machinery | 97 | 469 | 1,370 | 1,375 |
| Other machinery | 738,879 | 543,982 | 1,875,153 | 2,019,092 |
| Automobiles and other vehicles, except agricultural | 258,690 | 198,652 | 700,333 | 497,312 |
| Total | $1,819,672 | $2,084,261 | $4,718,486 | $4,435,879 |

# Machinery Markets and News of the Works

## APRIL BUSINESS OFF

### Machine Tool Volume Last Month Falls Below That of March

### Santa Fe Railroad Buys About 20 Machines and Union Pacific Is Also Placing Orders

MACHINE tool sales in April fell below those of March by 25 to 30 per cent for the country as a whole, though in the Cleveland-Detroit district, which has benefited by purchases by the automobile industry, the volume was about equal to that of the previous month.

While the bulk of the spring buying of shop equipment by the automobile companies has been completed, some business is expected from parts manufacturers who have been awarded contracts by the Ford Motor Co. for the making of repair parts for its old model T car, some of this work having been discontinued in the Ford plant. The Logangear Products Co., Detroit, has bought several machines for making pumps for Ford cars, and will buy some additional equipment.

In the railroad field, the principal activity was in Chicago, where the Santa Fe ordered about 20 machines and the Union Pacific has bought about a dozen tools. Small orders have been placed by the Rock Island and Burlington roads. Prospective buyers in the Chicago market are the J. I. Case Threshing Machine Co., Racine, Wis.; the Allis Chalmers Mfg. Co., Milwaukee, and the Nash Motors Co., Kenosha, Wis.

In the East, the principal buyers are the Wright Aeronautical Corporation and the General Electric Co.

## New York

NEW YORK, April 30.

THERE is a steady flow of business in single tools, so that April will apparently rank among the good months of the year, although with most sellers, March still stands as the largest month. The General Electric Co. has closed on several tools and the Wright Aeronautical Corporation is making further purchases of equipment. The New York Central Railroad has issued more inquiries for single pieces of equipment, but has not been a buyer recently. The automotive industry is still contributing much of the current business. Lathes are outstanding among sales of the past week. One seller, out of a total of 51 machines closed sold 23 lathes.

Recent sales have included a 16 x 36-in. Pratt & Whitney lathe to a Connecticut company; 20 x 48-in. lathe to a Vermont machine tool builder; two 16 x 60-in., one 16 x 84-in. and one 20 x 72-in. lathes to an Illinois company; 16 x 36-in. lathe to a Wisconsin motor manufacturer; 13 x 48-in. lathe to a Michigan automobile manufacturer; 16 x 36-in. and 20 x 48-in. lathes and 6-in. vertical shaper to an Indianapolis company. A Chicago company has closed on a Pratt & Whitney hob and cutter grinder and another Chicago manufacturer on a 7-in. thread milling cutter grinder; a Cleveland company on a 14-in. vertical surface grinder, and another Cleveland company on a No. 2 jig borer; a Michigan motor company on a 5-in. production hand milling machine and a Detroit company on four 5-in. production hand milling machines; a Baltimore company on a 3-spindle Sigourney drill and a tool and die manufacturer in Rochester on a 14-in. vertical surface grinder. A large electric manufacturer in New York State bought a 12 x 120-in. Pratt & Whitney thread milling machine, a No. 3 universal bench milling machine, a No. 2 jig borer and a 6-in. vertical shaper; a builder of aeroplane engines a 16 x 60-in. Pratt & Whitney lathe. The Pratt & Whitney Aircraft Corporation has closed on a 13 x 30-in. and three 13 x 36-in. Pratt & Whitney lathes, and the Michigan Central Railroad has bought a single spindle centering machine.

Contract has been let by Progressive Table Co., Inc., 372 Newport Street, Brooklyn, to I. Rosenblum & Sons, 1691 Carroll Street, for new two-story plant to cost about $60,000 with equipment. Kessler & Goldsmith, 5008 Church Avenue, are architects.

Junkers Corporation of America, Inc., 342 Madison Avenue, New York, subsidiary of Junkers Co. of Germany, builder of airplane Bremen, is planning establishment of new plant on site in Middle West for manufacture of complete line of Junkers aircraft, comprising parts and assembling and airplane motors. It is understood that a security issue will be sold to provide a fund for expansion.

De Rose & Cavalieri, 370 West 149th Street, New York, architects, have plans for a two-story automobile service, repair and garage building, 110 x 120 ft., to cost close to $100,000 with equipment.

Cities Service Co., 60 Wall Street, New York, operating electric light and power properties, oil refining plant and pipe lines, is disposing of a bond issue of $50,000,000, a portion of proceeds to be used for expansion and improvements.

Purty Boat Works, Bayview Colony, Port Washington, N. Y., N. Purty, president, has plans for a one-story boat-building and repair plant, to cost close to $100,000 with equipment.

H. I. Feldman, 415 Lexington Avenue, New York, architect, has filed plans for a six-story automobile service, repair and garage building, to cost approximately $200,000 with equipment.

Continental Can Co., 1 Pershing Square, New York, has purchased Southern Can Co., with main plant on 66-acre tract at Baltimore, with assets of about $3,500,000. Purchasing company will carry out an expansion program at Baltimore and other points in South. Passaic Metal Ware Co., Passaic, N. J., was recently acquired by purchasing company.

Electro Chemical Engraving Co., 52 Vanderbilt Avenue, New York, has awarded general contract to Turner Construction Co., for seven-story plant on Brook Avenue, to cost about $100,000 with equipment. C. B. Comstock, 110 West Fortieth Street, is architect.

Lackawanna Railroad Co., .0 West Street, New York, has authorized electrification of its suburban lines as far west as Dover, N. J., about 173 miles of track, using direct-volt overhead wire system of power transmission, to cost close to $18,000,000, of which approximately $4,000,000 will be used for electrical and mechanical equipment. A steam-operated electric generating station is being considered on Hackensack River, Kearny, N. J., for exclusive service, to cost more than $2,000,000. Work is scheduled for completion in about 24 months. G. L. Ray is chief engineer, and H. M. Warren, electrical engineer.

Officials of Pilot Electric Mfg. Co., 323 Berry Street, Brooklyn, have organized Nakken Television Corporation, to manufacture transmission equipment and receiving apparatus for broadcasting moving images. It is understood that portion of Pilot plant will be used for initial production.

American Brake Shoe & Foundry Co., 30 Church Street, New York, has authorized purchase of controlling interest in National Bearing Metals Corporation, St. Louis, manufacturer of brass and bronze castings, bearings, etc., and will

operate in conjunction with foundries and plants in different parts of country. Acquired company comprises a recent merger of More & Jones Brass & Metal Co., Keystone Bronze Co., Damascus Bronze Co. and Bronze Metal Co.

Cohen & Siegel, 45 West Fifty-seventh Street, New York, architects, have plans for a two-story automobile service, repair and garage building, 100 x 120 ft., to cost about $100,000 with equipment.

Board of Education, Boonton, N. J., is considering installation of manual training equipment in a new four-story high school to cost in excess of $300,000. Hacker & Hacker, Fort Lee Trust Building, Fort Lee, N. J., are architects.

Board of Education, City Hall, Newark, will receive bids until May 9 for equipment for schools, including metal-working machinery, wood-working machinery, work benches, steel cabinets, steel lockers, sharpening tools, iron and steel, electrical supplies, hardware, etc. R. D. Argue is secretary.

Colonial Western Airways, Inc., Hadley Field, near New Brunswick, N. J., contractor for Government air mail service to Boston, has leased a tract of two acres at municipal airport, Port Newark, Newark, for a new landing and operating headquarters. Plans are under way for construction of hangars, repair shops, oil storage and distributing building, and other mechanical structures.

British-American Metals Co., South Second Street, Plainfield, N. J., manufacturer of brass and copper tubing, etc., is arranging early call for bids for rebuilding of portion of plant recently destroyed by fire, with loss upward of $150,000 including equipment.

Betz Brothers, Inc., manufacturer of hollow metal doors and trim, is occupying its new factory at Pleasant Avenue and Ann Street, Clifton, N. J. It maintains sales offices at 20 Vesey Street, New York.

Roller Bearing Co. of America, 141 Frelinghuysen Avenue, Newark, manufacturer of roller bearings, has purchased plant of Mercer Motor Car Co., Trenton, N. J., and will install its present equipment and also purchase new machinery. Plant occupies 11½-acre tract and contains 175,000 sq. ft. of floor space.

## New England

BOSTON, April 30.

WITH quite a number of machine tool dealers April was the dullest month experienced in a long time. The contrast between New England and other sections of the country is most marked. A majority of New England machine tool builders, however, are fairly busy, especially makers of grinding equipment and some lines of lathes, and somewhat behind on deliveries of certain machines. The sale of tools to Connecticut River Valley manufacturers was the outstanding feature the past week, and included a lathe to a Vermont plant and five lathes and a radial drill to a Hartford manufacturer. New tool sales otherwise are few. The used tool market is also dull.

Small tool sales in April took a decided spurt in the last half of the month and business is better than it has been in a long time.

The activity of shops in the Connecticut Valley is accounted for in a large measure by work for the Ford Motor Co. and to building of aeroplane engines, the latter being centered at Hartford, Conn. The plant of the Westinghouse Electric & Mfg. Co., East Springfield, Mass., is considerably busier than it was a year ago. Rolls-Royce Co. of America, Inc., East Springfield, is proceeding at an excellent rate on automobiles and army and navy work. The Indian Motorcycle Co., Springfield, is maintaining a practically full night force to keep up with orders, not only for motorcycles, but shock absorbers and other accessories. Springfield drop forging plants are busy with automobile work. The plant of the Underwood Typewriter Co., Hartford, is producing practically two typewriters a minute, a new high record. The Russell Mfg. Co., Middletown, Conn., automotive products division is operating on overtime schedules, and its other departments also are busy. April production of the Fafnir Bearing Co., New Britain, Conn., was approximately 20 to 25 per cent greater than March.

Blackstone Valley Gas & Electric Co., Main Street, Pawtucket, R. I., has started work on a four-story and basement power house, 20 x 152 ft., for which equipment is still required.

Commonwealth Portland Cement Corporation, North Pownal, Vt., has tentative plans for a cement plant of 1,150,000 bbl. capacity. Bids for plant, machinery and machine tools are to be received by Kennedy-Van Saun Mfg. & Engineering Corporation, 50 Church Street, New York.

Atwater Mfg. Co., Plantsville, Conn., is building an addition to its plant to accommodate several new drop hammers.

Bohn Aluminum & Brass Corporation, Hartford, Conn., has awarded contracts for an extension which will increase its piston capacity 50 per cent.

In connection with expansion program, Boston Ice Co., 110 State Street, has purchased 20,500 sq. ft. at Chelsea, and plans construction of ice-manufacturing plant to cost upward of $100,000 with equipment. C. Leslie Weir, 41 East Forty-second Street, New York, engineer for Knickerbocker Ice Co., associated organization, will prepare plans.

R. H. Rines, Oak Street and Forest Avenue, Portland, Me., has filed plans for two-story automobile service, repair and garage building, 95 x 150 ft., to cost close to $100,000 with equipment.

Silverfill Mfg. Co., Inc., Boston, recently formed by Howard P. Cobb, 383 Belmont Street, Belmont, Mass., and associates, with capital of $100,000, contemplates operation of local plant for manufacture of line of metal products.

Blanchard Mfg. & Canning Co., Eastport, Me., will rebuild portion of plant destroyed by fire April 24, with loss more than $150,000 including equipment.

North Shore Ice Co., 46 Lake Street, Lynn, Mass., will soon begin work on one-story ice-manufacturing plant, 100 x 180 ft., to cost about $175,000 with equipment. Funk & Wilcox, 26 Pemberton Square, Boston, are architects. A. W. Thomas is president.

Board of Education, New Haven, Conn., has authorized installation of manual training department of new two-story school to be erected at County and Henry Streets. Bids have been asked on general contract by Brown & Von Beren, New Haven, architects. Cost is close to $200,000.

Willhite-Squires Mfg. Co., Winsted, Conn., manufacturer of tables, chairs and other furniture, has taken over former local factory of Carter & Hakes Co., and will remodel for expansion.

H. C. Hearne, 1389 Main Street, Springfield, Mass., architect, has revised plans for a three-story automobile service, repair and garage building, 110 x 140 ft., to cost close to $125,000 with equipment.

Henry J. Guild, Cambridge, Mass., formerly connected with Eastern Mfg. Co., Bangor and Lincoln, Me., operating paper mills has acquired plant of Berkshire Paper Co., Adams, Mass., at a public sale. Plans are under way for organization of new company to operate mill for manufacture of writing papers. Improvements will be made in equipment.

New Department Mfg. Co., Bristol, Conn., will make extensions and improvements in ball bearing plant, including dismantling of building No. 51 and erection in new location, with one-story building, 44 x 67 feet.

Steubing Cowan Co., Cincinnati, manufacturer of lift trucks and platforms has moved its plant at Holyoke, Mass., into larger quarters, where it will carry complete line of its standard model trucks for distribution through New England and Eastern territory.

## St. Louis

ST. LOUIS, April 30.

CONTRACT has been let by Pillsbury Flour Mills Co., Minneapolis, Minn., to Jones-Hettelsater Co., Mutual Building, Kansas City, Mo., for flour milling plant and elevator, 800,000-bu. capacity, to cost in excess of $600,000 with machinery.

Board of Education, Wichita, Kan., plans installation of manual training equipment in new one, two and three-story and basement high school to cost $750,000, for which bids are being asked on general contract until May 15. Glen H. Thomas, Wheeler-Kelly-Hagny Building, is architect.

International Oil Heating Co., 3939 Magnolia Street, St. Louis, manufacturer of oil-burning equipment, has asked bids on general contract for a two-story storage and distributing building, with shop for assembling, repairs, etc.

Southwest Gas Utilities Corporation, Ada, Okla., recently formed under Delaware laws to take over and operate 32 natural gas plants and systems in Oklahoma, Texas and Louisiana, is disposing of a bond issue of $1,750,000, a portion of the proceeds to be used for expansion and improvements, including pipe line construction.

Waxide Paper Co., Twentieth and Tracy Streets, Kansas City, Mo., has awarded general contract to Fruin-Colnon Construction Co., Merchants Laclede Building, St. Louis, for new one-story mill, to cost approximately $250,000 with equipment. L. Halger, 3844 Utah Place, St. Louis, is architect.

St. Louis Tool & Mfg. Co., St. Louis, recently organized by George D. Hart, 4920 Berthland Road, and associates, plans operation of local plant for manufacture of tools, dies and kindred equipment.

B. & H. Motor Co., 4517 Troost Street, St. Louis, is having plans drawn for a one-story automobile service, repair

## The Crane Market

THERE is very little new inquiry for overhead cranes and the locomotive crane field is less active than for several weeks. Business in both electric and hand power hoists continues good. Of the inquiries for overhead cranes that have been pending for some time, the 100-ton crane for the New York Edison Co., New York, is reported to have been closed. The largest outstanding business in locomotive cranes is the list of cranes and steam shovels inquired for by Dwight P. Robinson & Co., New York, for use in Argentina.

Among recent purchases are:

New Jersey Zinc Co., New York, 12-ton, 60-ft. span hand power crane for Palmerton, Pa., from unnamed builder.

International Combustion Engineering Co., New York, 25-ton, 8-wheel, locomotive crane for International Coal Carbonization Co., from Browning Crane Co.

Turner Construction Co., Boston, 3-ton, 26-ft. 6-in. span, single I-beam hand power crane from Ruggles-Klingeman Mfg. Co., Salem, Mass.

Gray's Harbor Railway & Light Corporation, Aberdeen, Wash., 15-ton, 48-ft. 3-in. span, 1-motor overhead crane from Box Crane & Hoist Corporation.

and garage building to cost about $100,000 with equipment. Archer & Gloyd, Orear-Leslie Building, are architects.

Cities Service Co., 60 Wall Street, New York, is said to be planning construction of a pipe line for natural gas transmission from Wichita, Kan., to Kansas City, Mo., connecting with its Panhandle trunk line from Pampa, Tex., to cost more than $500,000.

Underwood Compress Co., Hollis, Okla., is contemplating erection of a new cotton compressing plant, one story, 225 x 600 ft., to cost in excess of $125,000 with equipment.

Missouri Pacific Railroad, Railway Exchange, St. Louis, is in the market for two pneumatic flanging machines, two 18-in. lathes and a small portable pipe-cutting machine.

St. Louis Southwestern Railway Co., St. Louis, is inquiring for a 90-in. lathe for journal turning and quartering and crank pin turning, heavy-duty axle lathe and small belt-driven floor grinder.

Johnson Devices, Inc., 4340 Troost Avenue, Kansas City, Mo., has been organized to manufacture Johnson electromagnetic vaporizer. Manufacturing facilities have been secured at 1404 Agnes Street, Kansas City, and company is in market for No. 15 magnetic wire, 1½-in. brass tubing, fiber washers, double insulated electric cable, ¼-in. steel rods and ¼-in. black malleable iron pipe fittings.

## South Atlantic States

BALTIMORE, April 30.

BIDS will be received by Board of Awards, office of city register, City Hall, Baltimore, until May 9, for Department of Education for equipment for machine shops, electrical and wood-working shops. Specifications at office of director of business management, school board, Madison and Lafayette Avenues.

Officials of Safety Car Heating & Lighting Co., New Haven, Conn., and Davison Chemical Co., Garrett Building, Baltimore, are organizing Safety Refrigeration, Inc., to manufacture refrigerating equipment for railroad cars, with silica gel method of refrigeration, controlled by last-noted organization. C. Wilbur Miller, president of Davison company, will be prominently identified with new company.

M. Rich & Brothers Co., Broad Street, Atlanta, Ga., is planning construction of a two-story automobile service, repair and garage building, 90 x 100 ft., to cost approximately $90,000 with equipment.

Atlas Plywood Corporation, 31 St. James Avenue, Boston, is concluding arrangements for purchase of plant and business of Empire Mfg. Co., Goldsboro, N. C., manufacturer of textile frames and equipment, and will consolidate with organization. New owner plans expansion in southern district for textile mill apparatus.

Virginia Electric & Power Co., Richmond, Va., will issue bonds in amount of $8,000,000, a portion of fund to be used for general expansion and betterments, including acquisition of other properties, power plants and transmission line construction.

Baker County Power Co., Moultrie, Ga., has plans for an auxiliary steam-operated electric power house to supplement its hydroelectric power station at Newton, Ga., to cost close to $100,000 with transmission lines. Company is operated under direction of W. B. Foshay Co., Minneapolis, Minn.

Commissioner of Public Works, Summerville, S. C., is asking bids until May 10 for one 100,000-gal. capacity steel tank on 100-ft. steel tower, for municipal waterworks. Ryan Engineering Co., Arcade Building, Columbia, S. C., is engineer.

Standard Looms, Inc., Spartanburg, S. C., recently formed by Isaac Andrews, 519 East Main Street, and associates, with capital of $750,000, has engaged Lockwood, Greene & Co., Charlotte, N. C., and Boston, to prepare plans for one-story plant for manufacture of textile looms and kindred machinery, consisting of foundry, machine shop and assembling departments, to cost more than $150,000 with equipment. Mr. Andrews will be president; Jonas Northrop is vice-president and general manager.

DeLion Tire & Rubber Corporation, Fifth and Eager Streets, Baltimore, manufacturer of high pressure and balloon tires, etc., will carry out an expansion program with installation of additional equipment.

Board of Trustees, Lutheran Women's College, Rev. J. Henry Harms, 4614 Chester Avenue, Philadelphia, president, has authorized construction of central power house at new institutional buildings on 190-acre tract, vicinity of Silver Spring, Montgomery County, Md., to cost $750,000. Col. P. M. Anderson, Investment Building, Washington, is architect and engineer.

Burge & Stevens, Marietta Building, Atlanta, Ga., architects, will soon begin work on five-story and basement automobile service, repair and garage building, 90 x 135 ft., to cost upward of $250,000 with equipment.

## Philadelphia

PHILADELPHIA, April 30.

PLANS have been filed by Silverman & Levy, Elrae Building, Philadelphia, architects, for a three and four-story automobile service, repair and garage building, 93 x 110 ft., to cost close to $150,000 with equipment.

Chevrolet Motor Co., General Motors Building, Detroit, has awarded general contract to H. K. Ferguson Co., Cleveland, for a two-story factory branch and distributing plant, particularly for parts service, on Stokley Street, Philadelphia, to cost more than $90,000 with equipment.

Commercial Poster Co., 6545 Carnegie Avenue, Cleveland, manufacturer of signs, displays, etc., has purchased four factory units on two-acre tract at Philadelphia, heretofore held by Pennsylvania Globe Corporation for $300,000, and will use for new plant. Present business will be removed to acquired site.

York Ice Machinery Corporation, 1238-44 Belmont Avenue, Philadelphia, has revised plans for additions to plant, including improvements in present building, to cost upward of $65,000. Edmund H. Poggi, Equitable Building, is architect.

H. B. Weldon, 1817 Callowhill Street, Philadelphia, architect, has filed plans for a one-story automobile service, repair and garage building to cost about $115,000 with equipment.

Meirath Supply & Gasket Co., Inc., has been formed with capital of $100,000, to take over and expand company of same name with works at 617 Wood Street, manufacturer of gaskets, bolts, nuts, plumbers' supplies, etc. Earle G. Meirath is treasurer of new company.

H. S. Hagert, Inc., 1923 Manning Street, Philadelphia, manufacturer of lighting fixtures and equipment, has plans for an addition, including alterations in present factory. DeArmond, Ashmeade & Bickley, 20 South Fifteenth Street, are architects.

State Board of Education, Trenton, is arranging for establishment of a machine and repair shop at New Jersey School for Deaf, for repair and rebuilding of typewriters and other office machines used by State departments. State Budget Commission is providing fund for shop.

Standard Tank & Seat Co., 341 North Front Street, Camden, N. J., has awarded general contract to Barclay, White & Co., 1713 Sansom Street, Philadelphia, for a three-story addition, 32 x 80 ft., to cost more than $75,000 with equipment.

Camden Rail & Harbor Terminal Corporation, Camden, N. J., has awarded general contract to Cramp & Co., Dencker Building, Philadelphia, for a cold storage and refrigerating plant comprising three units, to cost $800,000 with machinery. Moores & Dunford, 110 East Forty-second Street, New York, are architects and engineers.

John A. Roebling's Sons Co., Roebling, Trenton, N. J., manufacturer of wire and cable, etc., has awarded contract

for electrical equipment for mill addition, now in progress, to General Electric Co., to cost about $175,000. Awards for other equipment will soon be made. New unit will represent investment of close to $700,000 with machinery.

Radio Condenser Co., Copewood and Thorn Streets, Camden, N. J., manufacturer of radio equipment and supplies, has filed plans for a one-story addition, 95 x 145 ft., for which general contract has been let to Carl L. Furner, 96 Kendall Boulevard, Oaklyn, to cost about $35,000 with equipment. Ernest L. Ergood, 320 Market Street, is architect.

Ovens, power equipment, conveying and other machinery will be installed in new one and two-story plant to be erected by Heimbach Baking Co., 701 North Ninth Street, Allentown, Pa., to cost $220,000, for which bids will soon be asked on general contract. Jacoby & Everett, Commonwealth Building, are architects.

A State charter has been secured by Reading Casting Co., Inc., Reading, Pa., with capital of $125,000, which plans for early operation of works at Monocacy, Pa., for production of iron and steel castings, forgings and kindred specialties. New company is headed by H. Claude Bell, 941 North Fourth Street, Reading; Lloyd A. Gass and Joseph E. Logan, both of Reading.

Reading Transportation Co., operated by Philadelphia & Reading Railroad, Philadelphia, for motor bus service, has plans for a one-story service, repair, garage and terminal building at Doylestown, Pa., and for similar unit at Pottsville, Pa., to cost upward of $165,000, with equipment.

Board of Education, Media, Pa., is considering installation of manual training equipment in two-story high and grade school addition to cost $200,000, for which bids are being asked on general contract. MacKenzie & Wiley, Bankers' Trust Building, Philadelphia, are architects.

Brown Products Corporation, Scranton, Pa., manufacturer of furniture, will rebuild portion of plant destroyed by fire April 22, with loss in excess of $125,000 with equipment.

## Pittsburgh

PITTSBURGH, April 30.

INQUIRIES for machine tools are fairly numerous, but actual business still is light. Most of the orders are for single items and the large number of repair parts sales emphasizes the tendency of buyers to delay as long as possible the placing of new equipment.

Miller Saw Trimmer Co., Point Building, Pittsburgh, will build a new one and two-story plant, 260 x 295 ft., to cost more than $250,000 with equipment. Hunting, Davis & Dunnells, Century Building, are architects and engineers.

Board of Education of George's Township, Fairchance, Pa., will soon take bids on general contract for a one-story manual training shop in connection with new gymnasium building at York Run, Pa., to cost $65,000. E. R. Johnson and C. F. Wilson, Fayette Title & Trust Building, Uniontown, Pa., are architects.

Board of Education, Fulton Building, Pittsburgh, is asking bids until May 15 for equipment for Clifford B. Connelly Trade School, including boilers, stokers, radiators, temperature regulating equipment, shaving exhaust system, unit heaters, etc. Bids for tools and equipment will be called later. George W. Gerwig is secretary.

Hope Natural Gas Co., Clarksburg, W. Va., has awarded general contract to Rust Engineering Co., 311 Ross Street, Pittsburgh, for a two-story automobile service, repair and garage building, 52 x 140 ft., to cost close to $100,000 with equipment.

Borough Clerk, Etna, Pa., will receive bids until May 14 for one 225-hp. horizontal watertube boiler and accessory equipment. J. N. Chester Engineers, Clark Building, Pittsburgh, are engineers.

Bradford Machine Co., Bradford, Pa., recently organized by P. D. Bonner, Bradford, and associates, with capital of $25,000, will operate local plant for manufacture of machine parts, tools and dies. H. A. Cooney, Bradford, will also be one of heads of new company.

Dravo Contracting Co., 302 Penn Avenue, Pittsburgh, operating a boat building and repair yard on Neville Island, is considering erection of one-story addition, 100 x 140 ft., to cost approximately $60,000 with equipment.

Board of Education, Ebensburg, Pa., plans installation of manual training equipment in two-story and basement high school, to cost about $175,000, for which general contract has just been let to J. C. Snyder, Altoona, Pa.

Clark Car Co., Pittsburgh, has removed its general offices to 1310 Clark Building.

## Chicago

CHICAGO, April 30.

INCREASED sales in the closing days of April were not sharp enough to bring the month's total volume up to that of March. Fresh inquiry is developing more rapidly and dealers generally are anticipating a good business in May. The Santa Fe has closed for about 20 items against its list and the Union Pacific is making purchases. The Burlington has ordered two 36-in. shapers and the Rock Island has purchased a drill press. The Nash Motors Co., Kenosha, Wis., is interested in grinders and drill presses and Allis-Chalmers Mfg. Co., Milwaukee, is in the market for miscellaneous tools. The J. I. Case Threshing Machine Co., Racine, Wis., is considering new equipment.

Used machinery is moving in fair volume but dealers are having difficulty in obtaining tools that are in good condition.

Glen E. Holmes, Inc., will erect 11-story garage at Dearborn and Lake Street, Chicago, on site 80 x 160-ft., to cost $900,000.

George Evans Corporation, Moline, Ill., manufacturer of tanks, will build an addition. Axel Carlson Construction Co. is general contractor.

Olson Mfg. Co., Albert Lea, Minn., manufacturer of barn equipment, has awarded contract for an addition to cost $20,000.

Sherwood Sanitary Furnace Co., Danville, Ill., has let contract to Modern Machine Shop, Inc., Danville, to manufacture steel parts and assemble furnaces which it will distribute. Wabash Valley Mfg. Co., Perryville, Ind., will furnish the castings.

A. L. Seaman & Co., manufacturers' agents for steel, brass and copper products, have moved from 549 West Washington Street, Chicago, to 222 West Adams Street.

W. C. West Co., sales agent for forged steel and malleable iron products, has moved from 14 East Jackson Boulevard, Chicago, to 435 North Michigan Avenue.

Moore Speed Crane Co., Chicago, has arranged with Manitowoc Engineering Works, Manitowoc, Wis., division of Manitowoc Shipbuilding Corporation, to build and sell Moore speed cranes. Moore company will continue as Chicago sales representative for these cranes and Forsythe Brothers, 30 Church Street, New York, will remain as New York sales agents.

Contract has been let by Ornamental Brass Shops, Inc., Tenth Avenue, Rockford, Ill., to Linden & Son, local, for a one-story addition, to cost about $30,000 with equipment. Peterson & Johnson, Swedish-American Bank Building, are architects.

Iowa Power & Light Co., Des Moines, Iowa, is disposing of a preferred stock issue of $1,000,000, a portion of proceeds to be used for expansion and improvements, including transmission line construction. Company is affiliated with Des Moines Electric Light Co. Clement Studebaker, Jr., is president.

Quaker Oats Co., 80 East Jackson Boulevard, Chicago, has awarded general contract to Leonard Construction Co., 37 South Wabash Avenue, for initial units for new plant at St. Joseph, Mo., to cost in excess of $2,000,000 with machinery. Project will include a boiler house and machine shop.

Common Council, New England, N. D., has authorized extensions and improvements in municipal electric light and power plant, with installation of equipment to double present capacity.

Iowa Soap Co., 816 Valley Street, Burlington, Iowa, has awarded general contract to A. Danielson Co., Burlington, for three-story factory, 100 x 160 ft., adjoining present plant, to cost $100,000 with machinery. Federal Engineering Co., Central Office Building, Davenport, Iowa, is engineer.

Abingdon Sanitary Mfg. Co., Abingdon, Ill., manufacturer of sanitary plumbing ware and equipment, has arranged for bond issue of $500,000, a portion of proceeds to be used for expansion in production.

Municipal Utilities Co., Des Moines, Iowa, is contemplating construction of new steam-operated electric power plant at Emmetsburg, Iowa, to cost about $150,000 with equipment.

Frank Foundry Co., Twenty-first Street, Moline, Ill., contemplates erection of one-story addition, to cost upward of $200,000 with equipment. W. A. C. Hogenbaeck is manager.

Lowry Sign & Advertising Co., 185 North La Salle Street, Chicago, manufacturer of electric signs and displays, has leased property at 428 Milwaukee Avenue, totaling 10,800 sq. ft. floor space, for expansion.

Board of Education, Dixon, Ill., plans installation of manual training equipment in new three-story high school

to cost $400,000 for which bids will be asked on general contract about middle of May. Royer, Danely & Smith, 301 West Main Street, Urbana, Ill., are architects.

Chicago Artificial Ice Co., 140 North Dearborn Street, Chicago, is disposing of a bond issue of $1,250,000 and note issue of $850,000, a portion of proceeds to be used for expansion in ice-manufacturing plants.

## Buffalo

BUFFALO, April 30.

BIDS have been asked by New York Central Railroad Co., Buffalo, for two one-story shop units at North Yards repair works, to cost more than $65,000 with equipment. F. B. Freeman, 466 Lexington Avenue, New York, is chief engineer.

Board of Education, Genesee Building, Buffalo, is planning installation of manual training equipment in three-story Riverside high school to cost $1,000,000, for which bids are being asked on general contract until May 10. F. J. and W. A. Kidd, 522 Franklin Street, are architects.

LeSuer Oil Corporation, Wellsville, N. Y., has acquired 50 acres of oil lands at Bolivar, N. Y., known as Frazer farm, and plans early installation of producing plant, including pressure pump and other power equipment.

Work will begin about May 15 on new plant unit of Afga-Ansco Mfg. Co., 23 Charles Street, Binghamton, N. Y., manufacturer of cameras, tripods and other photographic equipment, to be two to eight stories, 200 x 700 ft., and to cost more than $1,000,000 with equipment. Otto S. Schlick, 136 Liberty Street, New York, is engineer.

Crouse-Hinds Co., Syracuse, N. Y., manufacturer of electrical products, has plans for a one-story foundry addition, to cost more than $40,000 with equipment. Gaggin & Gaggin, University Building, are architects.

Officials of Rome Brass & Copper Co., Rome, N. Y., have organized Rome Hollow Wire & Tube Co., to take over and expand subsidiary organization of same name. New interest will specialize in iron and steel, brass and other metal products. Howard D. Wolfe, 804 North George Street, is one of principal incorporators.

School District No. 8, Black River, N. Y., is considering installation of manual training equipment in two-story high and grade school to cost about $170,000. Lansing & Green, Sherman Trust Building, Watertown, N. Y., are architects.

## Cincinnati

CINCINNATI, April 30.

MACHINE tool sales in April showed a considerable recession from the level attained in March, the decline being estimated at 25 to 30 per cent. There is a fair amount of inquiry before the trade, but buyers are hesitant about placing orders unless the purchase of equipment is imperative. While the automobile industry in the Detroit district is yielding a small volume of business, it is far less than in the first quarter, and buying from this source is likely to be light during the next few months. The Union Pacific Railroad is reported to have closed for about a dozen tools, but otherwise railroads have been inactive in the local market. The Dixie Construction Co., Birmingham, has contracted for a 600-lb. single frame steam hammer.

E. M. Hulse Furniture Co., 153 West Fulton Street, Columbus, Ohio, is completing plans for a three-story factory, 100 x 260 ft., to cost close to $275,000 with equipment. Carmichael & Millspaugh, 7 East Long Street, are architects.

Andrew Jergens Co., Alfred and Spring Grove Avenues, Cincinnati, is having plans drawn for a five-story addition to a soap manufacturing plant, to cost about $200,000 with equipment. Harry Hake, 2400 Gilbert Avenue, is architect.

Tri-State Compress Co., Bankers' Mortgage Building, Huston, Miss., Robert J. Cummings, head, has completed plans for a one-story cotton compressing plant, 260 x 1300 ft., in Hollywood district, Memphis, Tenn., to cost $300,000 with machinery.

Air Corps, Material Division, Wright Field, Dayton, Ohio, will receive bids until May 9 for aluminum alloy rivets, circular 314; streamline tie rods, circular 318; until May 10 for 16 engine gage assemblies, circular 315; 335 aircraft flight indicators, circular 312; 25 two-blade propellers, circular 319; until May 17 for 56 internal bomb rack assemblies, circular 317; and until May 9, for reconditioning Liberty engines in lots of 400 to 1940, circular 310. Air Corps headquarters, Washington, plans appropriation of $300,000 for transfer and establishment of experimental and testing plant to a permanent site at Wright Field.

Van Buren Township Board of Education, Clark Powell, Fairmount High School, Dayton, Ohio, business manager, contemplates installation of manual training equipment in new school to cost $500,000, for which Walker & Norwich, American Building, architects, will prepare plans.

Board of Trustees, Western State Teachers' College, Bowling Green, Ky., has approved plans for a one-story manual arts building to cost about $50,000. Brinton B. Davis, Columbia Building, Louisville, is architect.

Peter Fox & Sons Co., Fulton Market, Chicago, produce, is said to be completing plans for a new ice and cold storage plant at Nashville, Tenn., to cost upward of $300,000 with equipment.

## Milwaukee

MILWAUKEE, April 30.

WHILE some machine-tool plants experienced a somewhat larger volume of business this month, compared with March, others did not fare so well. On the average, however, April volume practically equals the previous month's bookings. The outlook is for a moderately active May trade, inquiry this month having been promising. The city of Milwaukee will soon be in the market with a list for the new fire department construction and repair shop, costing $100,000. Local machine shops as a rule are limiting their inquiry to replacement needs, or for one or two items to meet current requirements.

Unit Corporation of America, Fifty-third Avenue and Burnham Street, Milwaukee, is concluding negotiations for acquisition of Universal Power Shovel Co., Detroit, transaction being effected by an exchange of $750,000 of class A stock of Milwaukee company for controlling interest. William Ford, president Detroit company, will retire. Unit Corporation recently acquired Fuller & Sons Co., Kalamazoo, Mich., manufacturer of automotive transmissions, gears, etc. A $175,000 addition will be made to Fuller works, and Universal operation transferred to that point. Original members of Unit company are Obenberger Forge Co., and Dallmann Machine & Mfg. Co., both of Mauwaukee, which have consolidated their operations in the Obenberger works. William H. Schmidt is president.

Menomonee Falls Mfg. Co., Menomonee Falls, Wis., founder and machinist, sustained a loss of about $50,000 by fire on April 21. Plant was opened only recently for manufacture of bottle washing machinery as an addition to its foundry and machine shop business.

Excavation work has been started by Milwaukee department of public works for a new two-story brick and concrete shop, 100 x 200 ft., costing $100,000, adjoining present fire department repair shop. It will be used for manufacture of complete motor fire equipment, which has been carried on in a limited way for two years. Tooling needs are being scheduled but are not yet complete. R. E. Stoelting is commissioner of public works, and C. E. Malig, municipal architect.

Hicks Printing Co., Oshkosh, Wis., publisher of the Oshkosh *Daily Northwestern*, will erect a new printing and publishing plant to cost about $150,000. Architects are now being selected.

R. H. Bierman, 123 Wisconsin Avenue, Milwaukee, has been engaged by unnamed interests to prepare plans for a two-story automotive headquarters building, 75 x 125 ft., in Wauwatosa. It will cost about $75,000 and contain a machine and service shop. Bids will be taken about May 15.

National Plating Co., 43-45 Eighth Street, Milwaukee, has increased its capital stock from $50,000 to $75,000 and is completing plans for enlarging plant and production.

Milwaukee Ornamental Brass & Iron Works, Inc., has been incorporated with $25,000 capital stock and is establishing a plant at 685 Booth Street for production of gas and electric fixtures, lamps, novelties and similar merchandise. Bernard Breuer, 1124 Richards Street, is president.

Appleton Coated Paper Co., 1200 North Meade Street, Appleton, Wis., has plans by Lockwood, Greene & Co., consulting engineers, Chicago, for an addition to cost $125,000. Work will begin about the middle of May.

Arthur Fairbanks, 646 Madison Street, Waukesha, Wis., is erecting a welding shop, 30 x 50 ft., costing about $20,000 with additional equipment.

Milwaukee File & Rasp Co., 389 Tenth Street, Milwaukee, has increased its capital stock from $5,000 to $15,000 for enlargement.

## Detroit

DETROIT, April 30.

AN expansion and improvement program has been authorized by Macklin Co., Jackson, Mich., manufacturer of grinding wheels and other abrasive materials, including two one-story units and four new kilns, to triple present output. Work to cost upward of $100,000 with equipment.

Board of Education, Lincoln Park, Mich., plans installation of manual training equipment in new three-story high and grade school to cost $850,000, for which bids will soon be asked on general contract. Vernier, Wilhelm & Molby, Book Building, Detroit, are architects.

White Motor Co., East Seventy-ninth Street, Cleveland, manufacturer of trucks, will soon take bids for one-story factory branch, service and repair building, 185 x 200 ft., at Detroit, to cost approximately $135,000 with equipment. Hadlow, Hughes, Hick & Conrad, Union Mortgage Building, Cleveland, are architects.

Impression Die Co., 3155 East Willis Street, Detroit, has awarded general contract to Max Bartholomai Son & Co., 1574 East Warren Street, for a one-story addition, to cost close to $25,000 with equipment. Pollmar & Ropes, 2539 Woodward Street, are architects.

Collins Ice Co., Grand Rapids, Mich., is planning a two-story addition to cost about $35,000 with equipment.

AC Spark Plug Co., Flint, Mich., has awarded general contract to W. E. Wood Co., Ford Building, Detroit, for a three-story addition, to cost approximately $50,000 with equipment.

Officials of Chrysler Corporation, Highland Park, Detroit, have formed DeSoto Motor Corporation, a subsidiary, to manufacture a new six-cylinder car under name of DeSoto. Initial production will be carried out at main plant.

In connection with an expansion and improvement program to cost about $2,000,000, Grand Trunk Railroad System, 400 East Jefferson Street, Detroit, has authorized immediate erection of new engine house with repair facilities at Ferndale, Mich., to cost upward of $125,000 with equipment.

Grand Rapids Enamel Sign Corporation, 1331 Phillips Avenue, Southwest, Grand Rapids, Mich., has been organized to manufacture baked enamel signs on galvanized steel. Building has been constructed and is fully tooled for operations.

Fecheimer, Frank & Spedden, Inc., Detroit, will be located after May 12 in larger offices at 1224 Maccabee Building.

## Gulf States

BIRMINGHAM, April 30.

A COMPANY is being formed by A. S. Anderson, 519 Twenty-eighth Street, West Palm Beach, Fla., and associates to construct and operate a six-story cold storage and refrigerating plant, 100 x 300 ft., to cost close to $225,000 with equipment.

Bayou State Refining Corporation, Rosston, La., has begun construction of new oil refinery for production of lubricating oils, to cost $240,000 with machinery. Company is operated by Bayou State Oil Corporation.

Ovens, power equipment, conveying and other machinery will be installed in new plant to be erected by Brown Cracker & Candy Co., Dallas, Tex., at San Antonio, Tex., to cost approximately $300,000.

Oil Center Tool Co., 1111 East Twenty-first Street, Houston, Tex., manufacturer of oil well equipment and tools, plans a new one-story factory unit, to cost in excess of $30,000 with machinery.

Houston Gulf Gas Co., Houston, Tex., operating natural gas properties, is concluding arrangements for purchase of controlling interest in Houston Gas & Fuel Co., and Houston Gulf Pipe Line Co., Houston; and Southern Gas Co., San Antonio, Tex. A bond issue of $11,000,000 will be sold, a portion of fund to be used for acquiring properties noted and for expansion in pipe lines and system.

Reo Motor Car Co. of Texas, Inc., Dallas, Tex., has plans for a two-story service, repair and sales building, 100 x 200 ft., to cost about $150,000 with equipment. Entire second floor, totaling 20,000 sq. ft., will be equipped for machine shop service. Company also plans for similar works at Houston, Tex., to cost close to like sum.

Dalhart Public Service Co., Dalhart, Tex., has authorized enlargements in power plant and installation of additional equipment. Extensions in transmission lines are contemplated.

Board of Trustees, Drew Endowment Fund, Lake Charles, La., is planning construction of manual training school, to cost in excess of $100,000 with equipment. H. J. Geary, 929 North Division Street, is member of board in charge.

Union Utilities, Inc., El Paso, Tex., recently formed to take over and operate gas-manufacturing and distributing plants at El Paso, Galveston, Waco and Brenham, Tex., has arranged for a bond issue of $1,300,000, a portion of proceeds to be used for purchase of properties and for expansion in gas-generating and distributing facilities. Company will organize three subsidiaries, Texas Cities Gas Co., Galveston Gas Service Co., and Council Bluffs Gas Co.

Alamo Heights School Board, San Antonio, Tex., will install manual training department in new school to cost upward of $175,000, for which plans will be drawn by Harvey P. Smith, National Bank of Commerce Building, architect.

Maverick County Improvement District No. 1, Eagle Pass, Tex., W. L. Rockwell, engineer, has plans for a hydroelectric power house with capacity of 15,000 hp., for use with proposed irrigation system covering about 60,000 acres. Bids for equipment will be asked soon. Entire project will cost approximately $500,000.

Menefee Motor Co., 2111 Burgundy Street, New Orleans, has plans for new two-story service, repair and garage building, to cost close to $90,000 with equipment. James C. Menefee is head. Favrot & Livaudais, Hibernia Bank Building, are architects.

Peoples Utilities Co., Clinton, La., is completing plans for an electric light and power plant and one-story ice-manufacturing plant, adjoining, to cost more than $70,000 with machinery. E. K. Strahan, Pere Marquette Building, New Orleans, La., is engineer.

Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of industrial oxygen, gas, welding equipment, etc., has asked bids on general contract for first unit of plant at Shreveport, La., to cost close to $45,000 with equipment.

Electrical Equipment & Construction Co., Houston, Tex., has been organized to act as manufacturers' representative, consulting and sales engineer in adjacent territory for electrical products and equipment.

## Cleveland

CLEVELAND, April 30.

MACHINE tool business continues fair and the volume of sales during April was equal to, if not a little better, than in March. Some good business from automobile parts manufacturers helped considerably in holding up the April volume. A slight improvement is reported in the Detroit territory. The Logangear Products Co., Detroit, has purchased several machines for making pumps for Ford cars and has some additional equipment to buy. The Ford Motor Co. has placed some contracts with outside shops for the manufacture of repair parts for its old model T cars, discontinuing the making of certain parts in its own plant. Shops getting this Ford work are purchasing some additional equipment. Quite a little activity has developed in turret lathes in the Detroit territory in single tool orders. Locally, the market is rather slow. Railroad inquiries are scarce and are limited to single machines.

Bishop & Babcock Mfg. Co., Cleveland, will move its fan and blower plant from Watertown, Mass., to Cleveland. A building, 120 x 120 ft., will be erected, contract for which has been placed with H. K. Ferguson Co. A 5-ton 40-ft. span traveling crane will be installed.

Entire machinery and equipment of Ohio Body & Blower Co., Cleveland, will be sold at public auction, Wednesday, May 23, by Industrial Plants Corporation, auctioneer. Plant, which formerly had capacity of 100 closed car bodies daily, was operated for only two years prior to July 1, 1927, and contains 300,000 sq. ft. of floor space. Equipment to be sold includes woodworking, sheet metal and machine shop, glass finishing machinery, motors, etc. Sale is not subject to court confirmation.

American Electric Switch Corporation, Minerva, Ohio,, has added new building to its plant, providing 26,000 sq. ft. of floor space. It is connected with old plant with runway and electric conveyor and will house switchboard, panelboard, knife switch and shipping departments.

Plans are being arranged by Artcraft Metal Works, Athens, Ohio, operated by J. H. Grayson Mfg. Co., same city, for installation of equipment in new one-story plant, to cost more than $25,000.

Nokarbon Oil Burner Co., Cleveland, recently organized to manufacture a new type of industrial and domestic oil burner, will operate a temporary plant at 8612 Superior Avenue, N. E., to be devoted largely to assembling. It is purposed to establish permanent and larger works in near future. Howard W. White is president.

Thompson Products, Inc., 2196 Clarkwood Road, Cleveland, manufacturer of spring bolts, tie rod bolts and kindred products, with branch plant at Detroit, is disposing of a

stock issue totaling $1,050,000, of which approximately $265,000 will be used for additions and equipment.

Elyria Belting & Machine Co., Buckeye Street, Lorain, Ohio, is contemplating a one-story addition, to cost upward of $25,000 with equipment.

Ohio Aero Corporation, Youngstown, Ohio, recently formed by Judd Yoho, 3502 Market Street, and associates, will operate a local plant for aircraft manufacture, initial operations to be given over to assembling airplanes of two and three-passenger types. Warren P. Williamson and Hugh H. Hamilton, both of Youngstown, are interested in new company.

Plans have been completed for a reorganization of Williams Alloy Products Co., Elyria, Ohio. New company has authorized sale of 223,250 shares of stock, portion of proceeds to be used for expansion.

Empire Floor & Wall Tile Co., Zanesville, Ohio, is rebuilding portion of plant recently destroyed by fire, with loss of more than $300,000 including equipment.

Economy Engineering Co., Willoughby, Ohio, manufacturer of automatic bolt and nut machinery, has awarded contract to Frank S. Bones & Son, Willoughby, for one-story addition to increase its floor space 50 per cent.

## Indiana

INDIANAPOLIS, April 30.

PLANS are in progress for a steam-operated electric power house for Northern Indiana Public Service Co., Gary, at Michigan City, comprising group of 60,000-kw. turbo-generator units, with boilers and accessories, to cost more than $6,000,000. Extensions will be made in transmission lines.

Evansville Ice & Storage Co., Eighth and Division Streets, Evansville, Ind., will soon ask bids for a two-story and basement ice-manufacturing and cold storage plant, to cost about $65,000 with equipment.

Showers Brothers Mfg. Co., Bloomington, manufacturer of kitchen cabinets, etc., has awarded general contract to H. K. Ferguson Co., Cleveland, for a two-story addition, 60 x 150 ft., to cost about $100,000 with equipment.

Capital Airways, Inc., 705 Fletcher Trust Building, Indianapolis, is planning construction of an airport in vicinity of Broad Ripple district, comprising three hangars, repair shop and oil storage and distributing building, to cost close to $50,000.

Indiana Electric Corporation, Indianapolis, has secured permission to issue preferred stock totaling $2,604,500, a portion of proceeds to be used for expansion and betterments, including transmission line construction.

Montgomery Ward & Co., Chicago, has awarded general contract to M. J. Hoffman Construction Co., Furniture Building, Evansville, for a new three-story and basement storage and distributing plant at Evansville, to cost close to $200,000 with equipment. A. E. Neucks, Old National Bank Building, is architect.

Dudley Township Board of Education, New Lisbon, D. Ellabarger, trustee, is considering installation of manual training equipment in new high school at Straughn, to cost about $130,000. Houck & Smenner, 108 East Washington Street, Muncie, are architects.

## Pacific Coast

SAN FRANCISCO, April 25.

PLANS have been approved by Board of Education, Los Angeles, for a one-story addition to manual arts shop at George Washington High School, to cost about $40,000. Dodd & Richards, Architects Building, are architects.

California Co-Operative Producers, Inc., foot of Fourteenth Street, Oakland, Cal., has awarded general contract to Sacramento Industrial Corporation, Sacramento, for a new canning plant on 35-acre tract, including boiler plant, machine shop and other buildings, to cost about $300,000 with equipment.

San Carlos Ice & Cold Storage Co., Coolidge, Ariz., will erect a new one-story ice-manufacturing and cold storage plant to cost about $30,000.

Board of Education, Oakland, Cal., plans manual training shop unit at new high school group, entire project to cost about $500,000. Miller & Warnecke, 1404 Franklin Street, are architects.

Northwestern Pulp & Paper Co., Astoria, Ore., B. T. McBain, Portland, engineer and manager, will begin work in May on local pulp and paper mill, to have initial output of 100 tons per day. Project will include boiler plant and machine shop, and will cost in excess of $1,500,000 with machinery. Contracts for buildings have been let to Austin Co.

Oregon Short Line, Pocatello, Idaho, a division of Union Pacific Railroad System, Omaha, Neb., is planning extensions and improvements in local steam-operated electric power plant, to cost about $100,000 with equipment.

Pacific Petroleum Products Co., recently organized as subsidiary of Petroleum Securities Co., Richmond, Cal., will build a new storage and distributing plant at South San Francisco, to cost about $50,000 with equipment. Company is said to be negotiating for property at San Jose, Cal., for a similar plant.

Burke Packing Co., Astoria, Ore., will rebuild portion of cold storage and refrigerating plant recently destroyed by fire, with loss in excess of $50,000 including equipment.

San Juan Pulp Mfg. Co., Cornwall Avenue and Maple Street, Bellingham, Wash., has filed plans for an addition to digester division, to cost more than $85,000 with equipment.

Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has increased its capital stock from $240,000,000 to $400,000,000, a portion of proceeds to be used for expansion, including hydroelectric power plant and transmission line construction.

Southern Pacific Railroad Co., San Francisco, is reported planning extensions and improvements in locomotive shops at Sacramento, with installation of considerable additional equipment, to cost in excess of $1,000,000.

Clearwater Timber Co., Lewiston, Idaho, contemplates extensions in its mill and installation of additional equipment to cost about $250,000.

American Fruit Growers, Inc., Yakima, Wash., has plans for a new two-story cold storage plant, 110 x 180 ft., to cost about $150,000.

Brown Instrument Co., Philadelphia, manufacturer of measuring instruments, has secured larger quarters for its Pacific Coast branch at 420 Westinghouse Electric Building, 420 South San Pedro Street, Los Angeles. Stanley F. Godfrey is district manager.

## Canada

TORONTO, April 30.

MACHINE tool dealers and builders in this territory report a steady flow of new business mostly in single units. Sales for April compared favorably with those of March and business in May is expected to run into a fairly large volume. While automobile manufacturers have done most of their buying some sales are reported for replacement. Garages and automobile repair plants are constant buyers of single machines. Builders of machinery and tools have a considerable volume of unfilled orders on their books and look for almost capacity operations for some time.

Orders have been closed recently for large newsprint paper machines for International Paper Co.'s plant at Bathurst, N. B., and two for St. Lawrence Paper Co. It is reported that an order for one machine for Price Brothers has been divided between Dominion Engineering Co. and Charles Walmsley (Canada) Ltd. Contracts recently placed represent an expenditure of approximately $1,500,000.

Plant of Ontario Boat & Engine Works, Wallaceburg, Ont., was destroyed by fire April 22, with loss of $150,000.


**Branch Office Representatives of The Iron Age**

***Editorial***

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New Jersey, Hotel East Orange, East Orange, N. J., W. C. Sweetser
New York, 239 West Thirty-ninth St., W. C. Sweetser, Chester H. Ober
San Francisco, 320 Market St.....W. A. Douglass

W. W. Pearse, business administrator and secretary-treasurer Board of Education, 155 College Street, Toronto, is receiving bids until May 14 for equipment for machine shop, wood-working and electrical departments for new Collegiate Institute.

General Motors of Canada, Ltd., Oshawa, Ont., has let contract to Jackson-Lewis Co., Ltd., Federal Building, Toronto, for erection of one-story factory, 68 x 70 ft., to cost $25,000.

Bids are being called by Watt & Blackwell, architects, Bank of Toronto Chambers, for an addition to plant of Richards Wilcox Canadian Co., London, Ont., manufacturer of builders' hardware, fire-doors, etc. It will be one story, 78 x 190 ft., and cost $35,000.

Taylor Electric Mfg. Co., 526 Adelaide Street, London, Ont., has let contract to James Moran & Sons, local, for erection of a $40,000 addition, one story, 75 x 150 ft., for manufacture of electric switches, motor starters, etc. Watt & Blackwell, Bank of Toronto Chambers, London, are architects.

Wells & Gray, Ltd., Confederation Life Building, Toronto, general contractor, has let sub-contracts for new plant for Reid & Brown, Ltd., 63 Esplanade East. Plant will be one story, 70 x 300 ft., and include structural steel shop.

**Western Canada**

Waterpower site at Ghost Falls, Calgary, Alta., has been leased to the Calgary Power Co. It is understood that a plant will be erected to develop 15,000 hp., and cost $2,000,000. No announcement has been made as to when bids will be called for construction.

Elk River Syndicate, Ltd., Waldo, B. C., is contemplating construction of a power plant and pulp mill at Phillips Canyon on Elk River, to cost approximately $1,000,000.

Plans are being prepared for the construction of an additional power house on Jordan River, Vancouver Island, by British Columbia Electric Railway Co., Vancouver, B. C.

## Foreign

PLANS are being prepared by Vitkovice Iron Works, Bredorska 9, Prague, Czechoslovakia, for extensions in plant in Zabreh district, including one-story unit for production of railroad switches, to cost approximately $90,000 exclusive of machinery. Program will provide for expansion in other rolling mills and steel mill, with installation of new furnaces. American Consulate, Prague, K. L. Rankin, assistant trade commissioner, has information regarding project.

Quartermaster General, Washington, is asking bids until May 18, for three 750-hp. Diesel engines with accessories, for installation at Fort Mills, Philippine Islands.

Marconi Wireless Telegraph Co., Chelmsford, England, with local plant for manufacture of radio equipment, is planning establishment of a factory for similar production in Poland for trade in eastern Europe, to cost more than $250,000 with machinery.

A company at Castleton, England, has plans for a new cement mill near that city to cost close to $400,000, with machinery. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference England No. 65727; also at American Consulate, London, William L. Cooper, commercial attaché.

Brunner Maschinenfabrik, Prague, Czechoslovakia, manufacturer of machinery and mechanical appliances, is planning an expansion and improvement program, including installation of machinery and facilities for additions to line of construction equipment and apparatus for handling cement, concrete, etc. The ceramic machinery division will also be extended. American Consulate, Prague, K. L. Rankin, assistant trade commissioner, has information regarding project.

R. W. Hebard & Co., Inc., 32 Broadway, New York, engineer and contractor, has secured a contract from municipality of Puerto Limon, Republic of Costa Rica, for installation of a waterworks and sanitation system, including pumping machinery, power equipment, filtration equipment, etc., entire project to cost about $600,000.

## New Trade Publications

**Oil Burner.**—Johnston Mfg. Co., 2825 East Hennepin Avenue, Minneapolis. Catalog sheet 550-A of two pages illustrates and describes a new type of oil burner in which complete mixture of oil and air prior to entering the furnace is claimed.

**Electric Furnace Fittings.**—Globar Corporation, Niagara Falls, N. Y. Bulletin D of 12 pages illustrates and describes heating elements and terminal fittings for them, in connection with electric furnace use. Instructions are given for replacing elements while the furnace is in operation.

## THE LAST WORD

*(Contributed by the Reader Service Department of the Iron Age Publishing Co.)*

WE can hold out no longer. So great has been the pressure brought to bear on us to resume *The Last Word* that it is hereby resumed. Great will be the joy of the thousands who told us that the light of their lives went out when *The Last Word* was withdrawn.

The year is only one-fourth over but we know now who will win the 1928 prize for the most mixed metaphor. We needn't mention names but here is his entry, from page 797, in THE IRON AGE of March 22:

> Nevertheless, it did not take me long, when I got back into the game, *to pick up the threads and to see a hole in the grindstone when the hole was there!*

And let us give a hand, too, to George Rector, famed restaurateur, for the following in the revered *Sat. Eve. Post:*

"When the United States was in the forging,
New England was the foundry."

In a moment of weakness a contributor was permitted to use this column for broadcasting the question, *"What is the origin of the word chaplet, as used in the foundry industry?"* A chaplet manufacturer promptly wrote, *"I'll bite. What's the answer?"*

Hopefully your columnist turned to our contributor. He did not know. In a daze, dictionaries, histories, encyclopedias, etc., were consulted without success. Came the thought of referring to a recognized authority on foundry practice. Would he save our record of 100 per cent omniscience? He would, and here's how:

> Chapelet, later chaplet, is a small chapeau, which is French for hat. Another meaning is a small chapel, and drifting into foundry practice, it meant a small bent sheet, in form of a box or simple U laid flat.
>
> Again, another meaning is in connection with the Catholic rosary. Here, again, we have a connection with the molders of olden times, who may have thought of a resemblance between rosary beads and small chaplets.

*"How is steel wool made?"* we inquired seriously in our own private "Ask Me Another" contest. *"By shearing hydraulic rams,"* a pump manufacturer answers.

Perhaps some disciple of Dr. Freud can tell us why Dun's made the mistake of listing the business of Standart Brothers Hardware Corporation, Detroit, as "Whol Dresses, etc."

We lift our hat to the genius who fashioned the slogan, *"Cutting the price of caskets does not increase the death rate."*

Could the futility of price-cutting (in many kinds of businesses) be more succinctly expressed?

It seems to us that the Anderson Brothers Mfg. Co., Rockford, Ill., strikes the peak of specialization. The product of this firm is Eskimo pie-cutting machinery.

We are fond of this slogan used by Riehle Brothers Testing Machine Co., *"One test is worth a thousand expert opinions,"* and we should like to have a framed copy of it for our office wall.

Having a good slogan, they make good use of it by printing it at the *bottom*, not the top, of their business stationery. They realize that not one man in a hundred reads what is at the top of a letterhead. But the bottom *is read.*

A. H. D.